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Aramco Medical Department Oral History Project

HEALTH AND DISEASE IN SAUDI ARABIA:
THE ARAMCO EXPERIENCE, 1940s-1990s
VOLUME I

Interviews with

Richard Daggy
Armand P. Gelpi
Richard Handschin
Julius W. Taylor
Elinor Nichols
Dorothy McComb
Robert and Patricia Oertley
Ivor Morgan
Virginia Dooling
Richard Perrine
Ahmed Mustafa
Bernard J. Eggerman
Gordon Flom

Edited, and with an Introduction by
Armand P. Gelpi

Interviews Conducted by
Carole Hicke
in 1996 and 1997

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Health and Disease in Saudi Arabia: The Aramco Experience, 1940s-1990s,
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Recollections of fourteen medical professionals in Saudi Arabia who from the 1940s through the 1990s participated in a unique program to mitigate and solve not only the health problems of Aramco corporate employees and their dependents but those of the local population as well. Eliminating malaria; Harvard-Aramco Trachoma Project; Dhahran Health Center and outreach clinics in oasis villages; other health and disease problems: smallpox, Q fever, tuberculosis, sickle cell anemia, schistosomiasis, ascaris pneumonia, cholera; maternal and child health program; nursing staff; psychiatric care; surgical clinic; preventive medicine measures; ob/gyn clinic; dental care; new hospital facilities.

Interviews with Richard Daggy (b. 1914), medical director; Armand P. Gelpi (b. 1925), chief, medical services; Richard Handschin (1918-1997), medical director; Julius William Taylor (b. 1922), medical director; Elinor Nichols (b. 1927), wife of Roger Nichols, director, trachoma project; Dorothy McComb (b. 1931), researcher, trachoma project; Robert Oertley (b. 1925), director, preventive medicine, and wife Pat Oertley; Ivor Morgan (b. 1914), chief, ob/gyn services; Virginia Dooling (b. 1934), nurse supervisor; Richard Perrine (b. 1918), chief, internal medicine; Ahmed Mustafa (b. 1932), chief, internal medicine; Bernard J. Eggerman (b. 1927), chief, dental services; Gordon Flom (b. 1927), coordinator, medical development and construction. Written essay by John C. Snyder, dean, Harvard School of Public Health.

Edited, and with Volume Introduction by Armand P. Gelpi.

Interviewed 1995 to 1997 by Carole Hicke, Regional Oral History Office, The Bancroft Library, University of California, Berkeley.

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PATRON

Saudi Arabian Oil Company

DONORS

Paul Arnot
Elizabeth Arnot, in memory of Paul Arnot
Chevron (matching)
Richard Daggy
Carlton Dawson, in memory of Lewis V. Coleman
Lois and Gordon Flom
Dorothy McComb
Ivor I. Morgan
Richard P. Perrine
Peter and Ellen Speers
Julius W. Taylor

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INTRODUCTION

Early in 1995, this editor learned that The Bancroft Library at the University of California, Berkeley, had produced a collection of oral histories contributed by six retirees from the Arabian American Oil Company (Aramco). It told the story of developing and producing oil as a joint effort by Americans and Saudis. What made this collection unique is that its contributors played major roles in Aramco's management during its developmental years, before the company was turned over to the Saudi government as Saudi Aramco.

Now oil production--which is what Aramco did, and did well--is one thing. Exporting health care--which it also did--to what could well be considered a developing country in the 1930s and beyond is quite another. The scale on which this was done, the people who were key participants, the consequences for all those employees and their families associated with Aramco, and how Aramco's Medical Department provided services to the non-Aramco population of Saudi Arabia's Eastern Province seemed to be the ideal ingredients of an exciting story. Who could best tell this tale? The people who contributed so much in developing and extending Aramco's health care services.

Such a narrative required significant financial support. Ultimately, it was possible to obtain a generous grant from the donations committee of Saudi Aramco in Dhahran, Saudi Arabia, and after engaging The Bancroft Library and those who were destined to be contributors to this oral history collection, the project got underway. But it wasn't until late 1995 and early 1996 that the interviews began. Conservation of support funds was essential to bring the project along; and with this in mind, my Bancroft Library historian, Carole Hicke, and I decided to conduct interviews on a regional basis. It turned out that there were important concentrations of former Aramco Medical Department people in the New England, Puget Sound, and San Francisco Bay areas. We planned to obtain interviews from fourteen key people. We came away with twelve direct interviews, one telephone interview, and one written contribution. As this is being written, editing is underway on the last of the oral histories. And during the summer of 1997, we received a financial supplement to our original grant from Saudi Aramco to bring this project to its completion.

We feel fortunate to have had the cooperation and interest from those who made such vital contributions to Aramco's health care programs. But most of all, we are grateful for their oral histories. They tell of exotic diseases, hands-on care from dedicated doctors and nurses, creative and imaginative corporate administration, health care services which breached language and cultural barriers, lasting friendships, and cutting-edge medical research. I feel privileged to

have been a member of Aramco's health care team. Both Carole Hicke and I feel even more fortunate to have been able to put this project together for The Bancroft Library's Regional Oral History Office, for Saudi Aramco, and for those readers who--we hope--will recognize the scholarship with which we have tried to invest this work. We regret only that circumstances of geography and limited finances prevented us from obtaining and including interviews from others who made memorable contributions to the Aramco and Saudi Aramco health care programs.

Aramco Health Care--Beginnings and Evolution

It all began in 1936, with the arrival of T. C. Alexander, M.D., in Saudi Arabia. He was assigned to Dhahran as medical support for drilling operations being conducted by the California-Arabian Standard Oil Company (CASOC). This company was formed by Standard Oil Company of California (SOCAL), which ultimately became Chevron, Inc. Alexander's clinic was the first in the region and the first in the field for an American oil company operating in Saudi Arabia. This operation lacked a hospital; so cases needing hospitalization were sent to Bahrain Island, about twenty miles offshore. Among his other accomplishments, Dr. Alexander started to train young Saudi men as nursing assistants. Some of them were sent to Beirut for additional instruction as dental hygienists and dental technicians. The main medical problems confronting Alexander at this time were endemic communicable diseases such as malaria, trachoma, smallpox, and tuberculosis.

In 1937, families from the U.S. began to arrive in Dhahran, as the local workforce steadily expanded. During the World War II years, three more physicians were recruited, and wards were added to the existing clinics. On the night of October 19, 1940, both Dhahran and Bahrain were bombed by Italian planes; and subsequently, families were evacuated until the end of World War II.

In 1944, CASOC became the Arabian American Oil Company (Aramco), and the company opened a refinery in Ras Tanura together with clinic/dispensaries in both Ras Tanura and adjacent Rahima. These were for American and European expatriates (Ras Tanura) and for Saudi employees and their families (Rahima).

American families began to return in 1945, and by 1948 Aramco was operating clinics, infirmaries, a pharmacy, and hospitals--with a total bed capacity of 205--scattered throughout the areas of oil production. By this time Aramco's corporate structure included four owner companies: SOCAL, Standard Oil of New Jersey--later to become Exxon--Texaco, and Mobil. In 1949, Aramco began to add more hospital beds to its existing clinic facilities. The epidemiology of malaria in the Eastern Province was being explored and a malaria control program was underway.

In 1955 a collaborative research project on trachoma was established between Aramco's Medical Department and the Harvard School of Public Health. And in 1956 a hospital/clinic complex, Dhahran Health Center (DHC), was completed and opened as a secondary care facility for major surgery, isolation, intensive medical care, sophisticated laboratory and imaging services, field-wide medical administration, a base for preventive medicine and public health outreach, and for outpatient care. The same year, similar--though much smaller--facilities were opened in both Ras Tanura and Abqaiq, and their older units were closed. The Preventive Medicine Division at DHC started a program of tuberculosis case finding and control, maternal-child health clinics had been established, and health education projects were being developed.

In 1957, Aramco's Medical Department hired its first industrial hygienist, and by 1963 had its first occupational health physician. Preventive and curative medicine had entered upon a unique partnership which--together with its projects in medical research--would become the hallmark of Aramco's health care program.

Endemic Diseases

Despite the fact that Saudi Arabia was changing rapidly from a developing country into a nation which would resemble the technocracies of the West, the profile of disease was more representative of many third-world countries during the 1960s. And while there was an efflorescence of both private and government health care programs and facilities within the Kingdom, information on health demographics was lacking except as an extrapolation of epidemiologic data gathered by Aramco. But at this time, Aramco had been collecting extensive data on the incidence/prevalence of malaria and trachoma in the Eastern Province and on schistosomiasis elsewhere in the Kingdom. Large-scale epidemiologic investigations on conjunctivitis generally, and on trachoma in particular, were launched in 1955 as the first stage in the research project launched by the Aramco/Harvard collaborators.

Beginning in 1947, the Saudi government had developed a cooperative malaria surveillance program with Aramco in the Eastern Province. And control measures had started in 1948, primarily through an extensive residual spraying campaign utilizing DDT. There was an immediate and dramatic reduction in the incidence of malaria--both among employees and among villagers in outlying oases which were being monitored with annual malaria surveys. Resistance to DDT was encountered in 1953, and Dieldrin was introduced for residual spraying in 1955. By 1956, the Saudi government had taken the initiative for malaria control in the Eastern Province. And this, together with the more effective Dieldrin spraying, left malaria as a vanishing disease.

A program of smallpox eradication had been undertaken in the late 1950s by the Saudi government, and this disease soon disappeared from the Eastern Province. Tuberculosis remained an endemic problem. But with effective case finding--through x-ray screening and skin testing--early treatment with an arsenal of effective drugs, and meticulous outpatient followup, it appeared that Saudis could expect the same satisfying results from modern treatment as Europeans or Americans.

Although Saudi Arabia's Eastern Province was not an endemic area for schistosomiasis, the disease was rather common among Aramco employees--many of whom had come from the central and western regions of the Kingdom. In contrast to infected patients from other populations in the Middle East, the majority of Saudis seemed to have mild disease with few symptoms. In 1965, a team from Aramco's Preventive Medicine Division initiated a large-scale epidemiologic survey of sixty-seven communities scattered throughout the Kingdom. Hundreds of individuals were examined for evidence of disease--emphasis being on identification of schistosome eggs in the stool and/or urine--and scores of water sources were examined for evidence of the snail vectors which transmit this infection. What emerged from this investigation was a monograph, published as a limited, paperback edition in 1967. It remains unmatched as the most extensive and complete study of its kind ever carried out in Saudi Arabia.¹ It also remains relatively inaccessible, despite its importance as a point of reference for the most widespread previous and subsequent surveys. The most important results from this study were: there are two schistosomal worms represented in the Kingdom. S. mansoni is by far the most prevalent and is transmitted from many sources along the watershed on the eastern side of the great mountain chain which roughly parallels the coastline of the Red Sea. S. hematobium is confined to the western watershed of the same range. The Eastern Province is free of endemic disease and of snail vectors.

Another helminth infection of some importance was ascariasis. Generally regarded as relatively asymptomatic, it can sometimes be complicated by intestinal obstruction because of excessive numbers of parasites in the gut. But in Saudi Arabia there was an additional complication: seasonal pneumonitis due to pulmonary larval migration. This was exclusively a disease of Saudis, characteristically occurring each spring, usually several weeks after the brief, annual rainy season. Transmission was seasonal--limited to winter and spring--because of the intense daytime temperatures during the rest of the year, which prevented survival of helminth ova.

¹ Alio, Ivan. The Epidemiology of Schistosomiasis in Saudi Arabia with an Emphasis on Geographic Distribution Patterns. Riyadh, Saudi Arabia: University Press, 1967.

During the spring months there was also a recurring flu-like illness--Q fever--among Americans and other expatriates living in Aramco communities. This infection was presumably transmitted during the lambing/kidding season by infectious aerosols from products of conception within the herds of goats and sheep tended by the local Bedouin. What wasn't appreciated at the time was that Q fever is one of the most communicable of all infections--the inhalation of just a few organisms being enough to produce infection, sometimes illness. Which is why the organism, Coxiella burnetti, has been considered a candidate for biological warfare.

Trachoma was hyperendemic in the oases of Saudi Arabia's Eastern Province, with prevalence as high as 90 percent in some communities. The Harvard/Aramco research project was concerned with the clinical aspects, the epidemiology, and the prevention of trachoma. Ultimately epidemiological patterns emerged which indicated that trachoma was essentially a family disease, and that it was most prevalent in the most primitive and isolated oasis villages. Wherever trachoma was encountered, prevalence and severity could be correlated with the level of socioeconomic development and of sanitation. With prosperity and improvements in hygiene, clinical trachoma was less evident, and other indices of infection less apparent.

During the decade of the 1960s, the trachoma research program became the centerpiece for Aramco's research efforts--as the disease itself began to yield to the pressures of economic development and social change. To speed up this favorable trend, a field trial of immunization was carried out on almost 5,000 subjects--with both disappointing and inconclusive results. But the thrust of the program was to accumulate information on the epidemiology of the disease in Saudi Arabia, which would be of help in developing control measures, not only for the Kingdom, but for adjacent countries with endemic trachoma having similar climatic and social conditions. It is therefore somewhat ironic that in a 1976 comprehensive review of trachoma control in the Eastern Mediterranean, which contained data from several Middle East countries, there is not even one citation from the many publications by the Harvard/Aramco group. And the project is not even mentioned in the text.¹

Viral hepatitis was common in the Saudi population and was associated with high mortality among pregnant and recently delivered women. This phenomenon had been observed in Africa, other parts of the Middle East, and in an earlier, widespread epidemic in India. Although the specific viral agent could not be identified in the Saudi cases at the time, there is good reason to believe this infection was due to the

¹ Majcuk, J. Trachoma control in the Eastern Mediterranean region. WHO Chronicle 30: 97-100, 1967.

hepatitis E virus--based on more recent experience with infections due to this agent and on the sero-epidemiology of hepatitis E.

There is more to the story of communicable disease: the interviews in this series will mention some diseases included in this introduction. But some merit comment here. Typhoid reached a peak in 1956, with eighty-four cases reported in Aramco facilities for the year. Thereafter, there was a steady decline. Bacterial dysentery (Shigella infections) remained a significant endemic problem throughout the 1960s and 1970s with rates up to 50 per 10,000 population. Poliomyelitis was still present in the local population, and in 1973 there were ten reported cases of paralytic disease reported from Aramco medical facilities. The incidence of sexually transmitted disease increased through the 1970s, with gonococcal infection most often reported.

Tetanus was an endemic problem in the Saudi population at all ages, but mostly among the newborn. It seemed clear that neonatal tetanus was due to infection through contamination of the umbilicus shortly after birth. But among adults and children, the site of entry for viable tetanus organisms was often inapparent. With the advent of immunization programs--and thereby an emerging population of immune mothers--neonatal tetanus virtually disappeared among Aramco's Saudi newborns, and became a vanishing infection among children and adults for the same reasons.

Measles and chicken pox remained vexing problems among Aramco's Saudi dependent children. And it was not until measles immunization became as widely available in Saudi Arabia as it was in Europe and the United States that the former disease began to decline significantly.

Diarrheal disease, primarily in infants and children, was always a significant medical problem during the early years of Aramco's health care program. Hospitalizations steadily increased from 1956 to 1966, after which there was a steady decline through 1974 and beyond. Mortality from diarrheal disease, which peaked in 1962--prior to a steep rise in hospital admissions for this problem--declined rapidly, but ahead of the decline in morbidity. In most cases, the disease agent could not be identified, but Shigella species accounted for most of the bacterial isolates from stool samples.

Although there had been isolated reports of the disease cutaneous leishmaniasis (Oriental sore, Baghdad boil) from the Arabian peninsula before and during Aramco's early years, it was not until the 1970s that this condition reached epidemic proportions. Beginning with six cases in 1970, there was an explosive increase in the disease occurring among Aramco's Saudi employees and dependents--with a reported total of 542

cases by the end of 1979.¹ From the beginning, it was apparent that the majority of patients were from the large al-Hasa oasis; of these, 73 percent were under the age of fifteen years, with both sexes equally represented.

Reports of cutaneous leishmaniasis (CL) in widely separated areas of the Kingdom began to appear in published reports from sources outside of Aramco's Medical Department. For example, in a little more than a two-year period, it was possible to collect data on 726 cases of the disease referred to medical facilities in an area adjacent to Saudi Arabia's capital, Riyadh.² The clinical features of these cases were quite similar to those encountered among affected individuals reported to Aramco from al-Hasa--including a predilection for the extremities and the presence of multiple lesions in the same individual. In two key publications which described CL in a colony of European expatriates residing and working near Hofuf (al-Hasa oasis), both the clinical features and epidemiological clues suggested that the organism was L. tropica major, that P. papatasi (sandfly) was the vector, and that certain desert rodents (Meriones libycus and Meriones crassus) were the most likely natural hosts.^{3,4} Looking back on the Aramco experience with CL, it appears that there was a distinct seasonal pattern to disease outbreaks, with the largest proportion of cases presenting in the months of December into March.

The central issue in the evolution of CL in Saudi Arabia during the 1970s and 1980s appeared to be the ecology of this disease in relation to the dramatic social change and economic development which characterized this period. There were rapid population shifts, accelerated suburban development, and vast building projects which served to increase human contact with the sandfly vector. In addition, or alternatively, these conditions may have created an enrichment phenomenon--either by propagation of the CL parasites within the rodent population, an increase in the rodent population, or both. It was

¹ Aramco Medical Department: Epidemiological Bulletin 1-4, Jun-Jul, 1976; 1-7, Jan-Mar, 1980.

² Morsy, T.A. Oriental Sore in Riyadh, Saudi Arabia. Castellania 3: 155-157, 1975.

³ Bienzle, U., Ebert, F., and Dietrich, M. Cutaneous leishmaniasis in Eastern Saudi Arabia. Epidemiological and clinical features in a non-immune population living in an endemic area. Tropenmed. Parasit. 29: 188-193, 1978.

⁴ Buttiker, W., and Lous, D. J. Ecological studies in Hofuf, eastern Saudi Arabia, in relation to dermal leishmaniasis. Tropenmed. Parasit 30: 220-229, 1979.

difficult to test these hypotheses under conditions of continuing environmental change.

Another possibility is that widespread residual spraying for malaria in townsites of the Eastern Province had earlier decimated the sandfly population, thus interrupting transmission of CL. But residual spraying was to a great extent abandoned and replaced by a larviciding program in 1963 in the al-Hasa oasis, some eight years before the sharp increase in the incidence of CL was observed. Publications on the problem of cutaneous leishmaniasis in Saudi Arabia continue to appear from various sources outside of Saudi Aramco's medical services.

It was during the late 1960s that several noninfectious diseases attracted the attention of clinicians and researchers in Aramco's Medical Department. It was known that the sickle cell trait was present at a fairly high frequency within the oasis populations of the Eastern Province. But sickle cell disease was not diagnosed nearly as often as it should have been, simply because the disease was so mild in Saudis. This was--and still is--in striking contrast to the character of the disease in Africa and among African Americans. Studies on the distribution, the unique clinical features, the genetics, and the molecular biology of the condition in Saudis began with a collection of patients encountered on routine visits or during hospitalization for other, unrelated problems.

Ultimately these studies would involve a team of researchers from Oxford, as well as Aramco clinicians and technical support in the laboratories of Dhahran Health Center. Early revelations about the expression of sickle cell disease in Saudis attracted the attention of other workers in Saudi Arabia and elsewhere, leading to intense research efforts, which still continue in the Kingdom. A byproduct of the research on benign sickle cell disease in Saudis has been a greater understanding of certain genetic factors--other than the hemoglobin S gene itself--which modify the expression of the disease, and applications of this knowledge to develop new treatments for the more severe, African-type disease.

Other genetic markers which affected red blood cells in Saudis, particularly the oasis populations, are the thalassemias and glucose-6-phosphate dehydrogenase (G6PD) deficiency. The Saudis have thalassemias which suppress the production of both the alpha and beta hemoglobin chains, producing a wide range of phenotypes with altered red cell morphology, and a range of disease expression from the mildest anemia to the more incapacitating, so-called thalassemia major. And of course there is interaction with the sickle cell trait to produce genetic admixture which also modifies the expression of sickle cell disease and limits its severity.

The type of G6PD deficiency encountered among Saudis is severe, with almost complete absence of this red cell enzyme, which, among other problems, can lead to abrupt and intense hemolysis in affected subjects who ingest fava beans. The population genetics of this disorder have been thoroughly worked out in Saudis, and this research has been continued elsewhere--again, at other institutions in Saudi Arabia.

The unusual constellation of red cell genetic markers--G6PD deficiency, the thalassemias, and hemoglobin S, together and separately --are believed to confer considerable resistance to falciparum malaria, and most likely have profoundly affected both the endemicity and severity of this type of malaria in oasis populations. Finally, Saudis --again, primarily within the oasis populations--tend to lack the Duffy blood group antigens, which function as receptors on the human red cell for the Plasmodium vivax malarial parasite. Thus, the oasis Saudis have a significant immunity against vivax malaria. The Duffy negative blood group is an African genetic trait, shared to a lesser extent by Middle East populations and Americans of African descent. This cluster of genetic markers which confer resistance against two types of malaria is unique to oasis Saudis and to native Africans.

Medical Miscellany

The usual cancers which characterize aging populations of the West were less evident among the Saudis. In this group, lymphomas and leukemias were the most common, followed by stomach cancer. And typically, the lymphomas were of the non-Hodgkin's type, often presenting with abdominal disease, rather than with the peripheral or mediastinal adenopathy usually associated with lymphomas among other populations. It was difficult to distinguish abdominal lymphomas from abdominal tuberculosis--the two so often presenting with similar signs and symptoms. But by the mid-seventies, lung cancer was rapidly overtaking leukemias and lymphomas in incidence, primarily among an emerging, older, Saudi population.

What about degenerative diseases of middle age and beyond, which seem to plague Western societies? Basically, Aramco's health care program was involved with two rather distinct populations: a relatively small number of American and European expatriates--many with their young families--and a much larger group of primarily young Saudis. A relatively small proportion of Saudi employees had families at that time. The Americans and Europeans, as expected, experienced hypertension, coronary artery disease, and three major cancers--lung, breast, and colon--at about the same frequency and in the same age stratification as might be observed in America or Europe. But by the age of sixty, almost all of the expatriates had reached retirement and were on their way back to points of origin. They had not even joined the ranks of the "geriatric" population when they left Saudi Arabia.

Like retired military, most went on to other careers. And so prostate cancer and stroke were uncommon.

The population of Western smokers was again what you might expect --about 40 percent--before that landmark announcement by the U.S. Surgeon General in the 1960s. But Aramco's doctors were not seeing very much tobacco smoking-related diseases--chronic obstructive lung disease and mouth cancers--except for the emergence of lung cancer among aging Saudis.

Now the question of alcoholism and its consequences. The Saudi authorities strictly prohibit the importation and sale of alcoholic beverages. And there is no question that consumption of alcohol by Muslims is forbidden. Which left the issue of alcohol consumption by non-Muslim foreigners somewhat ambiguous. As it turned out, Western ingenuity and the Saudis' kindly tolerance for Westerners made it possible to produce and consume alcohol in privacy. Once again, this was with the understanding that alcohol consumption would not take place in Muslim company and would not be distributed--even as a gift--to Muslims.

Americans and others produced alcohol in the time-honored tradition of fermentation, using yeast and some source of sugar, and they went on to further refine and concentrate the product by a series of distillations, which often resulted in a concentration of ethanol approaching 95 percent. It would be safe to say that alcohol was available in abundance to many people in Saudi Arabia's Eastern Province.

Alcoholism, then, was a problem, but no more nor less than might be expected in any expatriate community representing a slice of America. Surprisingly, delirium tremens, acute alcoholic hallucinosis, alcoholic neuropathy, liver disease, and cardiomyopathy were rare.

But Aramco's medical problems were by no means confined to exotic diseases plus the usual degenerative diseases of Western society. As originally conceived, Aramco's health care program would be primarily concerned with employee health in an occupational setting. And in this context, environmental health and industrial medicine were to be important considerations.

As expected, in any large industrial undertaking--either domestic or foreign--employees were exposed to a variety of hazards in the workplace. And in an oil-producing area, with a subtropical-to-tropical climate, there were health risks in oil exploration, production, refining, storage, and transportation.

Surprisingly, heat exposure was less of a problem than anticipated. To a large extent, heat exhaustion and heat stroke were

prevented by attention to acclimatization, adequate water and salt intake, early removal from exposure when symptoms or signs suggested heat-related illness, and prompt supportive treatment for heat-related casualties. Much of Aramco's administrative apparatus and its personnel, community services, and medical care were housed in air-conditioned environments. Americans and other Western expatriates residing in Aramco communities were protected by residential air conditioning. For those working both outside and in interior environments in which air conditioning was lacking, every effort was made to avoid dangerous exposure to high temperatures.

Despite an active safety program inaugurated early in Aramco's history, there were a variety of job-related accidents and associated trauma. Risky chemical exposures, such as those related directly to oil production, were rare. As expected, poorly defined low back pain, without a clear history of job-related, predisposing incident, was fairly common. In later years, with increasing availability of auto transportation, there were also more motor vehicle accidents--with attendant trauma and occasional fatalities. In residential environments, among Saudi dependents, there was a significant number of burns from the use of gasoline-fueled stoves. Generally, this would result from ignition of loose garments.

Deluxe Health Care: Psychiatric and Dental Services

It took a generation of employees and dependents--some with incipient, some with florid psychosis or neurosis--before Aramco's health care system began to deal with psychiatric illness by utilizing professionals and facilities for psychiatric care at the Dhahran Health Center. In its early years, psychiatric problems of any consequence among expatriates were managed by referral to U.S. or European facilities. Ultimately, and despite cultural barriers, it was recognized that psychiatric disability was not uncommon among indigenous peoples of the Middle East. And of course, Saudi Arabia was no exception. As Aramco's Medical Department expanded in the 1970s, so did the subspecialties of psychiatry and clinical psychology.

One of the brilliant chapters in the story of Aramco's health care program is its history of dental care for expatriates and their families, and eventually for the Saudi population under the wing of Aramco's health care program. Ultimately, dental services included all the subspecialties of surgery, restorative dentistry, endodontia, periodontia, and orthodontia. Early on, dental care was incorporated into the district outpatient services. Dental specialty services were developed at Dhahran Health Center, and later as a large, free-standing dental clinic--adjacent to DHC--with a full range of treatment and preventive services.

Dramatis Personae

Those who have contributed to this collection of oral histories will tell stories which will deal with Aramco's health care program in more detail--highlighting certain disease problems, medical research, relationships with non-Aramco health care agencies and medical care facilities, disease prevention, health care facility design and construction, interaction with various parts of Aramco's administrative elements, and personal experiences related to work and residence in Saudi Arabia.

Three of the contributors to this series rose from the ranks to become Aramco medical directors: Drs. Daggy, Handschin, and Taylor. Three others rose to head Internal Medicine and the Medical Services unit: Drs. Gelpi, Mustafa, and Perrine. Three others were intimately involved in the trachoma research project sponsored by the Harvard School of Public Health and supported by Aramco: Dr. John Snyder (Harvard School of Public Health), Elinor Nichols--the widow of Roger Nichols, field director of the project--and Dorothy McComb, technologist for the trachoma laboratory at Dhahran Health Center.

Dr. Bernard Eggerman, DDS, pioneered the development of Aramco's comprehensive dental care program, integrating it with the medical department's health care program. Virginia Dooling, RN, was key player in the nursing service--both in hands-on nursing care and nursing administration. Dr. Robert Oertley had several roles in Aramco's health care operation: family practitioner, district medical director, and epidemiologist. His wife, Pat, jointly contributed her experiences to this collection. Dr. Ivor Morgan was Aramco's first obstetrician. Mr. Gordon Flom was a prime mover in Aramco's medical facility renovations and construction during the 1970s. Interestingly, there was almost continuous interaction between our contributors--both socially and professionally--during parts of three decades, spanning the mid-fifties to the late seventies.

Besides anecdotal information on how they came to work in Aramco's health care program, contributors elaborate on the many facets of health care--both to Americans and to Saudis and their families--and on life in Saudi Arabia. We learn more about endemic malaria in the Eastern Province and measures taken not only to control this disease but to virtually eliminate it from oasis communities in which it was holoendemic. There is more about trachoma: the disease, the village surveys which mapped its epidemiology, about laboratory isolation of the infectious agent, the use of a new screening technique--fluorescent antibody microscopy--to identify and quantify the infectious agent in scrapings from the inner eyelid surfaces, about the vaccine trial, and about treatment and prevention.

Contributors elaborate on some of the clinical problems encountered among American employees and their dependents, as well as

those which were more representative of the Saudi work force and Saudi dependents. They repeatedly refer to the interaction between Aramco's health care staff and the physicians and nursing staffs of those local facilities outside of Aramco which were ultimately utilized for primary care and routine hospitalization of Aramco employees and their dependents.

They comment in some detail as to how the liaison between Aramco and these "contract" facilities was established and sustained. And contributors have much to say about relationships between the medical staffs in Dhahran and the two districts: Ras Tanura and Abqaiq. There is considerable commentary about the relationship between the Medical Department, the company's Industrial Relations executives, and other top-level management. There is talk about how Aramco's health care program influenced the evolution of private and government health care services in Saudi Arabia.

There is continual emphasis on professional standards, accountability, quality assessment, periodic evaluation by the American Joint Commission on Hospital Accreditation, and upon continuing medical education. Contributors help us to understand how research on local medical problems added to general medical knowledge as well as enabling practitioners to use this knowledge in disease prevention and patient care. There is material on hospital and facility construction brought about by the rapid expansion of oil production, with corresponding increases in the size of the work force and the numbers of dependents eligible for health care.

We learn about the demographics of health and disease in eastern Saudi Arabia, and how they were changed by Aramco's health care program. We learn how Aramco's corporate structure affected administration in its Medical Department. And we can trace a continuous thread of interaction between preventive and curative services within Aramco's health care program.

We can see how physicians, nurses, other technical staff, and administrators were personally affected by their experiences with Saudis and Saudi society, by life in Saudi Arabia, and by their new understanding of Middle East cultures. And last of all, we learn something about the destinies of those who left Aramco for other professional pursuits back in the U.S.

It may seem strange that there is so little said about Aramco's corporate change from its role as a creature of Mobil, Exxon, Texaco, and Chevron to an oil company owned and operated by the Saudi government. Officially, Aramco was nationalized on November 11, 1988. But in fact, preparations had started in 1980, and there were gradual changes in management structure throughout the company--including the Medical Department--from that time until the corporate change became

official. The reason that little is made of this change by those contributing to this oral history collection is simply that changing Aramco's Medical Department to Saudi Aramco Medical Services Organization (SAMSO) was gradual, smooth, and essentially uncomplicated.

In summary, this collection of oral histories is a record of astonishing achievement in the provision of health care services to employees and dependents of a major oil company operating in a harsh environment and in a rapidly changing society and national economy. It is the story of health services extended beyond employees and their dependents, of health care provided to a needy general public before government and entrepreneurial services were widely available. And it is a story of major research efforts carried out on such diseases as malaria, trachoma, sickle cell disease, and schistosomiasis. Here we have an unparalleled, corporate accomplishment, not only in major industry, but as a vast humanitarian effort in personalized health care, disease prevention, health education, and biomedical research. No other corporation has matched this joint endeavor of oil production and health services--either at home or abroad.

Acknowledgements

This collection would not have been possible without the splendid, individual contributions from former members of Aramco and Saudi Aramco's health care program. The essential financial support was provided by Saudi Aramco's donations committee, both to get the project underway (1995) and to keep it afloat (1997). Carole Hicke, oral historian and colleague, from the Regional Oral History Office of The Bancroft Library at the University of California, Berkeley, conducted all of the interviews--more than forty hours worth of taped dialogue--and collaborated with this editor/contributor to produce written, edited transcripts, which form the bulk of this publication. My thanks goes also to Willa Baum, director of the Regional Oral History Office, and to Shannon Page, its office manager, and to other staff for their support and interest. I am indebted to Saudi Aramco's Medical Services Organization's Tarek M. Khattab, M.D., for some early historical material about Aramco's Medical Department. This appeared in his essay, "The Development of Medical Services in Saudi Aramco." And an abbreviated version appeared in the August 25, 1993 issue of the Dhahran publication The Arabian Sun. Last of all I want to thank Mr. Daniel Blucker of Dhahran Health Center's medical library for a bibliography of recent publications by SAMSO staff physicians and for photo-illustrations of Aramco and Saudi Aramco health care facilities.

Armand P. Gelpi, M.D.

December 9, 1997
Sonoma, California

VOLUME HISTORY

Aramco began producing oil in Saudi Arabia in 1938. Its name then was California Arabian Standard Oil Company (Casoc), and it was owned by Standard Oil Company of California (Socal). King 'Abd al 'Aziz had granted Socal the concession in 1933 to explore for and produce oil in parts of Saudi Arabia, and the company finally encountered oil in commercial quantities after five years of searching.

So began the annals of a unique corporate enterprise, unique because of its size, its Arabian operations, and its close interaction with the people of Saudi Arabia. Early leadership by company officers such as Tom Barger and Cy Hardy fostered attitudes of pluralism and respect for the Saudi culture. The Saudis, for their part, responded with equal measure. Great efforts were made by the Americans to train and promote Saudis, and great efforts were made by the Saudis to provide for the needs of the oil company. Thus, cooperation became the keynote.

Aramco's interest in Arabia extended beyond the production of oil. For example, the company used its resources to collect and preserve old books and manuscripts concerning the history of the country. Railroads, roads, electrification, natural gas recovery--all were added to the company's accomplishments to the benefit of the local economy. Even more singular, perhaps most remarkable of all, was the work of the Aramco Medical Department in achieving unprecedented successes in the research and treatment of local, tropical diseases, in local public health programs, and in preventive medicine projects.

Why would a company owned by four giant American oil corporations (Standard Oil, now Chevron, eventually brought in Mobil, Texaco, and Exxon as owner/shareholders) provide crucial medical services to the local economy of its offshore operations? Partly, it seems, because the need, like the distant mountain to be climbed, "was there." Partly, also, because the Americans and other expatriates were interested in Saudi Arabia. And partly out of inevitability.

First there was the need for health care for the Americans. Paul Arnot, who joined Aramco in 1938 as an engineer, recalled no company clinic in existence. The nearest facility was at Bahrain. Clearly, it was more efficient to establish a clinic in Dhahran.

As oil operations increased and numbers of employees rose, more medical staff was hired, and services grew. Saudi employees were covered, of course, but it became evident that their families needed help also. As Frank Jungers, former chairman and CEO of Aramco, explained, "We just tried to move in the direction of providing good care and minimizing work force disruption."

New laboratory facilities were required, and this made possible research into local tropical diseases, including a study of trachoma jointly sponsored by Aramco and Harvard Medical School. Malaria was prevalent, and local village people needed help; mosquito abatement would clearly benefit both the people and the company. Further expansion of oil production resulted in more employees and the need for more and better medical facilities. Thus the growth of the Medical Department, thoroughly documented in this volume of oral histories.

Its success was monumental. Take the preventive medicine program, for example. Before the mosquito abatement effort was undertaken, a quarter of the employees had at least one attack of malaria a year. By 1963, fewer than a dozen cases were acquired in the Eastern Province. Further, in the 1940s and fifties, deaths from communicable diseases, such as tuberculosis, pneumonia, smallpox, hepatitis, malaria, typhoid and viruses, were common; in the 1960s, the death rate of employees from these diseases dropped to zero. The maternal and child health program was equally effective: in 1958, 250 of every 1,000 children died in their first year of life. By 1966, the number was down to 30 of 1,000.

The oral histories in this volume encompass most of the post-World War II decades, and continue through the building of new facilities completed in the 1980s. By that time, company ownership had been vested in the Saudis, who continued the work of the Medical Department.

An earlier volume of Aramco oral histories¹ contains interviews with company management--engineers, financial and legal officers, geologists, and researchers, as well as top-level executives. A few wives commented on life in Dhahran. Completed in 1995, this volume came to the attention of Dr. Armand P. Gelpi, who was with Aramco in the 1960s. Dr. Gelpi was fervently interested in documenting the history of the Medical Department, unequaled for its pioneering work on several fronts: research in exotic diseases; establishment of local clinics; the Harvard-funded study of trachoma; social and cultural interaction. Dr. Gelpi, in consultation with staff at the Regional Oral History Office, began planning the project and invited Saudi Aramco, as the company is now named, to underwrite it. Company officers graciously agreed.

Dr. Gelpi located the interviewees and established contact with them, smoothing the way for the interviews. He reviewed the transcripts, wrote an introduction to each, and indexed them. His work along the way has been indispensable, and we are inordinately grateful to him for his interest and efforts. Many Saudis and expatriates from other countries could have contributed significantly to this history,

¹American Perspectives of Aramco, the Saudi-Arabian Oil-Producing Company, 1930s to 1980s, Regional Oral History Office, The Bancroft Library, University of California, Berkeley, 1995.

but restraints of distance and travel put these out of our reach for the present.

The Regional Oral History Office was established in 1954 to augment through tape-recorded memoirs the Library's materials on the history of California and the West. Copies of all interviews are available for research use in The Bancroft Library and in the UCLA Department of Special Collections. The office is under the direction of Willa K. Baum, Division Head, and the administrative direction of Charles B. Faulhaber, James D. Hart Director of The Bancroft Library, University of California, Berkeley.

Carole Hicke, Interviewer/Editor

Regional Oral History Office
Berkeley, California
March 1998

Regional Oral History Office
The Bancroft Library

University of California
Berkeley, California

Aramco Medical Department Oral History Project

Richard H. Daggy, Ph.D., Dr. P.H.

PREVENTIVE MEDICINE IN SAUDI ARABIA, 1947-1964

An Interview Conducted by
Carole Hicke
in 1996

Since 1954 the Regional Oral History Office has been interviewing leading participants in or well-placed witnesses to major events in the development of Northern California, the West, and the Nation. Oral history is a method of collecting historical information through tape-recorded interviews between a narrator with firsthand knowledge of historically significant events and a well-informed interviewer, with the goal of preserving substantive additions to the historical record. The tape recording is transcribed, lightly edited for continuity and clarity, and reviewed by the interviewee. The corrected manuscript is indexed, bound with photographs and illustrative materials, and placed in The Bancroft Library at the University of California, Berkeley, and in other research collections for scholarly use. Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, partisan, deeply involved, and irreplaceable.

All uses of this manuscript are covered by a legal agreement between The Regents of the University of California and Richard H. Daggy dated April 21, 1996. The manuscript is thereby made available for research purposes. All literary rights in the manuscript, including the right to publish, are reserved to The Bancroft Library of the University of California, Berkeley. No part of the manuscript may be quoted for publication without the written permission of the Director of The Bancroft Library of the University of California, Berkeley.

Requests for permission to quote for publication should be addressed to the Regional Oral History Office, 486 Library, University of California, Berkeley 94720, and should include identification of the specific passages to be quoted, anticipated use of the passages, and identification of the user. The legal agreement with Richard H. Daggy requires that he be notified of the request and allowed thirty days in which to respond.

It is recommended that this oral history be cited as follows:

Interview with Richard Daggy, an oral
history conducted in 1996 by Carole Hicke
in "Health and Disease in Saudi Arabia:
The Aramco Experience, 1940s-1990s,"
Regional Oral History Office, The Bancroft
Library, University of California,
Berkeley, 1998.

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INTRODUCTION to Richard Daggy, Ph.D.

One of the most important elements of Aramco's health care program--dating back to Aramco's early years--was its medical department's Division of Preventive Medicine. In terms of its scope of activity and accomplishments, it was coequal with curative medicine, and in this sense it filled a unique role in establishing standards for sanitation, pest control, communicable disease prevention, and other environmental safeguards for the company, its employees and dependents, and the communities in which they resided. Dr. Daggy was one of Aramco's medical pioneers, and in this role he rose to head Preventive Medicine and eventually to guide the staff of the Medical Department as its medical director. The importance of his studies on the epidemiology of oasis malaria in Saudi Arabia and his efforts in establishing malaria surveillance and control procedures for Aramco and the Kingdom cannot be overstated.

Armand P. Gelpi, M.D.

December 9, 1997
Sonoma, California

INTERVIEW HISTORY--Richard Daggy, Ph.D.

Dr. Richard Daggy joined Aramco in 1947 as medical entomologist. Within two years he became superintendent of Preventive Medicine Division, and from 1952-1960 he was chief of Preventive Medicine. From 1960-1964 he was Aramco's medical director. Daggy's work in eradicating malaria has received the highest praise from other members of the medical staff who were in Saudi Arabia. For example, Dr. Phil Gelpi said: "I was able to see, in the eight-year period that I was in a full-time position at Aramco [1959-1967], a very rapid decrease of malaria infections in the Eastern Province. I don't think there is any question that this is directly attributable to the Aramco program that was initiated by Dr. Daggy and was eventually taken up by the Ministry of Health." The importance of this program to Saudi Arabs cannot be overstated.

Daggy began by taking a malaria survey in about fifteen villages throughout the Eastern Province. Rounding up the children in each village--and bribing them with fig newtons!--Daggy and his cohorts took blood samples and analyzed them for malaria parasites. In some places, he found 90-95 percent were positive. He then undertook a program of spraying in the villages, checking the effect every few weeks. Daggy delineated the results of his ten-year study in a major article published in The American Journal of Tropical Medicine and Hygiene in 1959.

Daggy was interviewed in his country home near New Boston, New Hampshire on April 21, 1996. His son, Hormoz Soheili, prepared a delicious lunch, which we ate on an outdoor balcony overlooking woods, a stream, and a bird feeder with many visitors.

Daggy contributed further to the project by underwriting lodging expenses for my trip to Boston to interview him and other members of the Aramco Medical Department.

The transcript was reviewed by interviewer and editor; few changes were made.

Carole Hicke
Project Director

January 1997
Regional Oral History Office
University of California, Berkeley

Curriculum Vitae

RICHARD HENRY DAGGY, Ph.D., Dr.P.H.
RETIRED

Born: August 23, 1914, St. Paul, Minnesota

Marital Status: Single
Citizen: U.S.A.

Academic Training:

| <u>Dates</u> | <u>Institution</u> | <u>Degree</u> |
|--------------|--|--------------------------|
| 1934 | University of Minnesota | S.B. (with distinction) |
| 1938 | University of Minnesota | S.M. |
| 1941 | University of Minnesota | Ph.D. |
| 1952 | Harvard University | M.P.H. (magna cum laude) |
| 1958 | Harvard University | Dr.P.H. |
| 1960 | Columbia University- Program in Executive Management, School of Business Administration | Certificate |

Positions Held:

| <u>Dates</u> | <u>Position</u> | <u>Name of Institution or Agency</u> |
|--------------|---|--|
| 1939-1941 | Instructor in Biology | Bemidji State College, Bemidji, Minnesota |
| 1942-1944 | Ensign to Lt. (H-Vs) Entomologist | USNR Malaria Control Unit, South Pacific-New Hebrides |
| 1944-1945 | Associate Entomologist | Naval Medical School, Bethesda, Maryland |
| 1945-1947 | Associate Professor of Entomology | University of Minnesota |
| 1947-1949 | Medical Entomologist | Arabian American Oil Co. Dhahran, Saudi Arabia |
| 1949-1952 | Superintendent | Preventive Medicine Division Arabian American Oil Co. |
| 1952-1960 | Preventive Medicine Coordinator & Assistant to the Medical Director | Arabian American Oil Co. |

Positions Held (Continued)

| <u>Dates</u> | <u>Position</u> | <u>Name of Institution or Agency</u> |
|------------------------|---|--------------------------------------|
| 1960-1964 | Medical Director | Arabian American Oil Co. |
| 1954-1952 | Visiting Lecturer on Entomology | Harvard School of Public Health |
| 1962-1964 | Visiting Lecturer on Tropical Public Health | Harvard School of Public Health |
| 1964-1966 | Assistant Dean for International Programs, and Lecturer on Tropical Public Health | Harvard School of Public Health |
| 1965-1966 | Acting Head, Department of Public Health Practice | Harvard School of Public Health |
| 1966-1973 | Associate Dean for International Programs, Faculty Advisor for International Students, & Lecturer on Tropical Public Health | Harvard School of Public Health |
| 1968-1970 | Acting Head, Department of Microbiology | Harvard School of Public Health |
| 1969 (Nov.)-1970 (May) | Acting Dean, Faculty of Public Health | Harvard School of Public Health |
| 1971-1972 | Acting Dean, Faculty of Public Health | Harvard School of Public Health |
| 1964-1982 | Lecturer on Tropical Public Health (retired June 1982) | Harvard School of Public Health |

Membership in Professional Societies:

American Association for the Advancement of Science
 American Public Health Association (Fellow)
 American Society of Tropical Medicine and Hygiene
 Delta Omega (National Honorary Society in Public Health)
 Entomological Society of America
 Explorers Club
 Massachusetts Public Health Association
 Royal Society for Tropical Medicine and Hygiene (Fellow)
 Sigma Xi (National Scientific Honorary Society)
 Society for International Development
 World Affairs Council (Boston)

Other:

Member, Advisory Committee, Development Advisory Service, Center for International Studies, Harvard University, 1965-
 Associate Director, Aramco Trachoma Research Program, 1959-1964
 Member, Program Area Committee on International Health, American Public Health Association, 1967-
 Liaison Officer, International Fellowship Programs, Association of American Medical Colleges, 1968-
 Member, Committee on Instruction, Harvard University, 1968-

Selected Publications:

- Daggy, R.H., Muegge, A., and Riley, W.A.: A preliminary study of the anopheline mosquito fauna of southeastern Minnesota and adjacent Wisconsin areas. Pub.Hlth.Reps. 56: 883-895, 1941.
- Daggy, R.H.: *Aedes scutellaris hebrideus* Edwards: a probable vector of dengue in the New Hebrides. War. Med., 6: 292-293, 1944.
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- Daggy, R.H.: New species and previously undescribed naiads of some Minnesota mayflies (*Ephemeroptera*). Ann. Ent. Soc. Am., 38: 373-396, 1945.
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- Daggy, R.H.: Handbook of Residual Spray Operations. USPHS, Office of Malaria Control in War Areas, Atlanta, Georgia, 45 pp., 1945 (processed).
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- Daggy, R.H.: The administration of medical care and health services by Aramco in Saudi Arabia. The Medical Bulletin, 64: 1-23, 1964. Standard Oil Co. (N.J.), New York, N.Y.

I BACKGROUND AND EDUCATION

[Interview 1: April 21, 1996]##¹

Hicke: I'd like to start this morning by asking you when and where you were born.

Daggy: St. Paul, Minnesota, August 23, 1914.

Hicke: And did you grow up in St. Paul?

Daggy: I did.

Hicke: Where did you go to school?

Daggy: I went to high school and the University of Minnesota.

Hicke: At the university, what was your major?

Daggy: My original major was zoology, biology. I'm Bachelor of Science. I took a Master of Science and Doctoral Philosophy degree in medical entomology.

Hicke: You got the Doctor of Philosophy, and then you also got another degree, I believe.

Daggy: At Harvard, yes, years later.

Hicke: What was that degree in?

Daggy: Practical public health.

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¹This symbol (##) indicates that a tape or tape segment has begun or ended. A guide to the tapes follows the transcript.

II JOINING ARAMCO

Applying and Interviewing

- Hicke: After you got your Doctor of Philosophy, you were doing various things, but let me ask you when you first started to get interested in Aramco.
- Daggy: Oh, after the war, in 1947, I guess. I had returned to the University of Minnesota to be on the staff, but I was not particularly interested in agricultural entomology. I was interested primarily in medical entomology--malaria control, that kind of thing. I had explored various opportunities in South America and Venezuela, and then I got a phone call from an old malaria control buddy [whom I had known] in the South Pacific who asked if I was interested in Aramco.
- Hicke: Who was this, what was his name?
- Daggy: Dr. [Robert] Page. He died some years ago.
- Hicke: Can you tell me anything about him?
- Daggy: No, he was at the Texas Company primarily.
- Hicke: Texaco?
- Daggy: Texaco, and then he later came to Arabia, much after I did.
- Hicke: I believe that was 1948. Did they interview you?
- Daggy: Yes, I sort of interviewed them. I wrote them and said I was a little puzzled as to why malaria could be such a big problem in Saudi Arabia. I thought it was nothing more than a sea of sand.
- Hicke: That was my first reaction when I heard about it too.

Daggy: Exactly. I was puzzled as to why a good, self-respecting malaria mosquito could make its way in Saudi Arabia. They said that they'd like to interview me in New York. I agreed, but I felt it was kind of a waste of time. Malaria and Saudi Arabia didn't seem to go together very well. When I arrived, they put me up in New York at the hotel, and I soon found out in talking to them that there was indeed a malaria problem, and I was interested in it. I had reason to think that I would have plenty of chances to go to Venezuela, to South America, but I would never get a chance to go to Arabia, I thought. This was a new area and a big opportunity for me, and I found myself agreeing to go and signing up.

Hicke: As what?

Daggy: As entomologist.

Hicke: Do you recall who interviewed you in New York?

Daggy: Dr. Page was one of them; he was associate medical director of the Texas Company at the time. The Texas Company did some of the recruiting for Aramco at that time. I don't remember the name of the medical director as such. This would have been 1946, maybe '47. Dr. Robert C. Page was the distinctive one; he later became medical director of Aramco and a close friend of mine.

Moving to Saudi Arabia

Hicke: So then did you move to Saudi Arabia?

Daggy: Yes. I recall getting on a plane and flying to London. The British had done some work on malaria control in Palestine and the Middle East. So I stopped at the London School of Tropical Medicine to see what I could find out about malaria in that part of the world. Then I flew on from London and I very vividly remember flying into Malta. In those days you put down overnight, you didn't fly at night, and we put down in Malta for the night. I can remember vividly in the next morning flying over the North African desert battlefield, the Rommel area. And then I flew on to Cairo, and joined the Aramco plane--they had their own plane in those days. I joined the Aramco flight in Cairo, took off across the Red Sea, and once I got across the Arabian Peninsula I thought: My God, what have I done? What have I done?

Hicke: Was this looking down on it or when you got out of the plane?

Daggy: No, looking down on the whole countryside. It was just all sand, it looked like to me. When I got to the Dhahran airport--the Dhahran airport in those days was kind of a corrugated tin shack. I can remember having to walk over a kind of sand dune to get into the corrugated iron building, and again I thought: What have I done, what have I done?

Hicke: What time of year was this?

Daggy: This was about June 7th, early June, 1947. The hot season had just begun, and the *shamal*, the wind, was blowing. It was not showing Saudi Arabia at its best. I was met by someone at the plane and taken to accommodations in a dormitory.

Hicke: You lived in a dormitory?

Daggy: Well, a dormitory room. I was very lucky; most of the people were in shared quarters. We had eight men--what we called an eight-man bunkhouse, two to a room. But I had a private room, in sort of an exclusive area, special bachelor guest house, that was it.

Hicke: How did you rate that?

Daggy: My position, I guess.

Hicke: I see. Was there an entomologist there before you?

Daggy: No, there had never been any entomologist.

III ELIMINATING MALARIA IN SAUDI ARABIA

Identifying the Problem

Hicke: Do you know who--somebody in management--said this is a big problem, we need an entomologist?

Daggy: Well, they recognized that Aramco had the problem, not in the American population because that was in the Dhahran compound. Apparently the King, 'Abd al-'Aziz, the unifier of Saudi Arabia, had heard or learned something about the marvels of DDT in malaria control. And he asked Aramco to look into it.

Aramco also had some part of the problem, especially in their Saudi Arab employees and their Saudi Arab dependents. But not in the American community. The camp was located in a non-mosquito zone in--

Hicke: It was in a dry area.

Daggy: In a dry area, no oases.

Hicke: I guess we should clarify this; as I understand it, the mosquitos were mostly in the oases.

Daggy: The mosquito breeding was occurring in the oases. I should probably break off for a moment here. Since before biblical times, the Arabs on the coast had a series of artesian wells, flowing wells, all up and down the coast. My idea of an oasis, of course, was a little pool of water and three strategically placed palm trees, and that was it.

Hicke: Mine too.

Daggy: To my surprise, I found that some of the areas around oases were extremely large, fifteen and twenty villages, large towns and

maybe fifty to hundred thousand people, all up and down the coast. People were concentrated in the villages and in the oases, and the mosquitos were all concentrated, of course, in the springs and the water-bearing areas. And of course, malaria had existed there from time immemorial to the present.

Hicke: Did they understand that mosquitos were causing it?

Daggy: No, no, I don't think so. Some of them may have, but most of them did not. The ordinary local farmer did not. The population was primarily divided into two groups: The Bedouin, who lived out in the desert, and the so-called "Sown," who were the farmers. They raised dates and winter vegetables, alfalfa for their animals, and so on. The Aramco towns were in the desert, and they were far away from any mosquitos or malaria in that sense.

Hicke: Were the employees, some of them, still living in these villages in the oases?

Daggy: Yes, some of them, and sometimes, especially in the malaria season, they would come down with malaria. A headman or a foreman would come down with malaria, and then the rest of them would not have any direction. Some of the men would get it too, of course, but it would be particularly difficult when the Saudi foremen or Saudi headmen were down with malaria. There were some deaths among the Saudi employees, but not very many. If they were going to die, they died as children. The malaria was very, very intense in these areas.

Hicke: So are you saying they developed some sort of resistance?

Daggy: Well, some immunity; there were relatively few deaths among the adults. Among the children of employees, dependents, there was probably a high death rate. For example, you would find that a woman may have seven or eight children, and only one or two would have survived, or even less. She would indicate that the fever got them. That was probably not entirely malaria, but probably to a large degree due to malaria. So it was having a greater impact on the children than on the adults, and that was one of the keys that we used to measure malaria in the area.

Taking the Malaria Survey: A Ten-Year Study

Hicke: Tell me what you started out doing. Well, first of all, where were your offices?

Daggy: We had an office in one of these portable bunkhouses at first. My first job was to begin to get out in the fields and take a malaria survey. I found these pictures to show you. [points to picture] This is the way we'd round up kids in the village.

Hicke: You had some people helping you?

Daggy: We'd round up kids in the local village square, and then bribe them by giving them fig newtons for a drop of blood. We'd stab them, take a blood smear, and take the slides back to the laboratory and examine them for malaria parasites. We did this in quite a few villages. The first year we covered about thirteen, fourteen villages, and then second year we went to a nearby oasis, Hofuf oasis, and did that as well.

Hicke: Do you have any idea how many samples you took?

Daggy: Oh, this was done over a ten-year period, so there would be thousands.

Hicke: What's this? [points to pamphlet] Is this one of your writings?

Daggy: Yes, that's the ten-year study, the major study on malaria.¹

Hicke: Did you spend all your time taking these samples in the villages?

Daggy: No, no, this was seasonal. Usually in the fall for a few weeks, during the worst part of the malaria season, we'd take samples from the children and calculate the percentage positive for malaria parasites. Then we'd calculate the percentage of positives in that village and get a general estimate of the amount of malaria in that village. Some places it would be 90, 95 percent of the children running around with these parasites, and no telling how many would have been sick and probably died of infection. But that was a benchmark against which we could measure the amount of malaria in the area, and that would be also a benchmark against which we could measure the success of our control measures.

¹Richard H. Daggy, "Malaria in Oases of Eastern Saudi Arabia," *The American Journal of Tropical Medicine and Hygiene*, Vol. 8, No. 2 (part 2), March 1959, 223-291.

Malaria Controls

Hicke: When did you start instituting controls?

Daggy: We had to wait for supplies. After the war I worked for the Public Health Service on a DDT spray program in the South. Malaria was present in the South, in the southern states, particularly in the negro shacks and so on, very poor people. We sprayed the inside of the tar paper shacks against the malaria mosquitos.

I should point out the theory behind this. DDT was a wartime discovery. It had been touted as a malaria control measure because of its long-lasting effects in houses. You'd take a house like this and spray the walls and the ceilings and all the rooms in the house, and you'd lay a thin coating of DDT. You probably wouldn't even be able to see it on a white wall, for example, but it would remain there for a varying length of time. We found out that in Saudi Arabia, because of the dry climate and so on, you put on the spray coating of DDT in the early fall and it would last for almost a year until the next season, which was quite different from in more humid climates where you had to reapply the spray at different intervals. We found out that we could spray once a year. I don't whether you want to get this yet or not. So once we got all our equipment in--

Hicke: Is this your equipment in this picture?

Daggy: Yes, we had crews like this going.

Hicke: That was for the spraying.

Daggy: Yes, spraying the walls and the ceilings. They were mainly palm thatch huts. You might as well pull these pictures out first to get an idea of what the place is like. That gave us a base for measuring malaria. The theory was: after the spray was put on, the mosquitos would rest on the walls and the ceilings during the day and then come out at night to feed. Screens were unknown, obviously, and people slept outdoors very seldom, because there was no protection against mosquitos as such.

The malaria mosquitos don't annoy; they're not like other mosquitos, buzzing around and making a noise and biting. You don't know that you're being bitten actually, it's a nonpainful bite, for the most part. And then filled up with blood, the mosquitos would find a stable or a barn or a house to rest on the walls. In some places I remember, it was almost as if you took a

handful of wet raisins and threw them against the wall and they'd all stick to the wall. They'd be hanging onto the wall.

That was the cause of their downfall, because they would absorb the DDT through their feet and be killed, and if they weren't killed the first night they would be killed on the second or third or fourth or fifth. It usually takes about two weeks for the malaria parasite to mature and to be passed on to another person by a bite, so you had about two weeks--ten days to two weeks--to get at the mosquitos if you didn't get them the first night. But usually they would be killed in the houses, and that was the focus of the malaria attack.

Hicke: Did the people object to having you come in and spray?

Daggy: Well, sometimes. These were mainly shacks, pretty much. As soon as they saw it was a means to be safe, they didn't object. Actually, they didn't have any right to object. The governor had absolute power.

Hicke: Oh I see. You had the support of their local sheik or amir?

Daggy: For the most part they wouldn't object, although if they had a particularly nice house they might. But they soon found out that all the spiders and flies and scorpions and things like that would be killed by the same DDT spray. Most of them didn't connect the mosquito control with malaria control; they relished the idea of having their house fly-free and tick-free and scorpion-free right away, but I'm sure most of them didn't connect the mosquito death with the drop in malaria.

Hicke: Since the king had interested himself, did you have to report to the government?

Daggy: No, they let us do the whole works ourselves. An agreement was made whereby they were supposed to have put up the money for the DDT supplies, because it was going out to a public health program in the villages and not in the company towns. Sometimes they would not pay up on time, or they couldn't pay their bills--it was quite a bit later that they had all the money--but they came around.

Hicke: Did you have other Americans working with you and some Saudis?

Daggy: I had one American assistant, that's probably who you saw in the picture.

Hicke: What was his name, can you recall?

Daggy: Don Strait. Then we had some of these Arab boys that you saw here in the picture. We had headmen who would be gang pushers, foremen--

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Hicke: You had the headmen and then you had the people that sprayed?

Daggy: Yes, the spray workers and so on. Spray crew. And then during the malaria survey season, we had some of our American laboratory technicians, who would come out and do the village finger sticking for us. They enjoyed the chance to get out into the villages. It was a kind of holiday for them, in a sense. And of course it only took a few days.

Hicke: After you sprayed most of the places in a village, then would you go back?

Daggy: Then I would go back and count the mosquitos on the wall. I soon found out that they had almost entirely disappeared. I had regular checkpoints which I visited every few weeks in various villages. I soon found out that at first, compared to how it had been before spraying, with these raisins on the wall, there were just absolutely none resting on the walls, for a time. And then a very few would begin to reappear toward the end of summer, just before it was time to spray again. So we would repeat the cycle. We would repeat the cycle, both as far as blood checks and the DDT spray program, once every year for most of the ten years. And the malaria rate dropped precipitously down to a couple percent, compared to 97 percent of the kids.

Hicke: Obviously the Saudi employees were much better off but also all the local population.

Daggy: The local population was better off and the effect on the children was impressive; there were almost no deaths--well, we had no way of knowing about what the deaths in the villages were.

Hicke: That must have been very rewarding for you.

Daggy: Yes.

Hicke: Can you tell me some of the villages you visited, are the names within reach? They're in that book.

Daggy: Damman, al-Khobar, Jubail, Dhahran, Abqaiq, Ras Tanura, Thuqbah, Qatif, Saihat, Safwa, Tarut. And so on down the list.

Hicke: That's a lot. How long do you think it took, probably, over this period of ten years before you saw this amazing change?

Daggy: Well, there were a series of changes. Occasionally, we would have a problem--the government would refuse to pay its bill, or just couldn't. So the company thought they would just have to draw the line somewhere. We were going up and treating all the villages in the area, which was not a responsibility of Aramco as such, and if they weren't going to pay for it, so be it. So every once in a while when they would stop spraying DDT, the mosquitos would come back in the houses and again rest on the walls and bite the people and so on. And then the malaria rate would go up.

I should interject here that all the mosquitos weren't being killed, obviously, only the ones that were resting on the walls of the houses, and those were the ones that were most likely to be infected with the malaria parasite, and those were the ones which were most likely to transmit it. So for the others, it had to be, for the most part, repeated each year.

Ultimately you probably would cut down on the total number of mosquitos that were infected, but you wouldn't know that unless you dissected them and found out whether they were infected or not.

Hicke: Are you telling me you didn't know how many were infected?

Daggy: You could count the numbers of mosquitos, as such, but that doesn't mean that they were all infected or any of them were infected. But obviously in the beginning a large number of them were or you wouldn't have had the drop in malaria, or the increase in malaria that happened when we skipped the year. It would go up and down, up and down, every fall.

Hicke: So it would start to rise again, as you said, just before you were ready to spray?

Daggy: When the first DDT was put on, the malaria rate dropped precipitously, down, down, down, down, down.

Hicke: Oh yes. [Looking at a chart] Started in '47, and then actually by 1949 it had dropped hugely.

Daggy: That was the major, major drop. When they stopped doing spraying, stopped buying DDT, we had to skip on certain years, and it was almost an alternate year for a time. And that gave us a good chance to really explore what was going on, although we didn't like the idea of skipping a year and losing all that time. But we gradually were able to cut down, even on an alternate-year basis,

on the number of infected mosquitos over the year, even by the alternate spraying and nonspraying. Then later they got with it and got the supplies coming through on a routine basis; so you could plan, that way. You must remember that the supplies of DDT had to be ordered about nine months in advance, for ocean shipment.

Hicke: Where did it come from?

Daggy: Oh, I think most of it came from the U.S.

Hicke: Now I understand you used some other things besides DDT?

Daggy: Yes. Then we began to see a peculiar thing that occurred. The DDT seemed not to be as effective against the mosquitos as it once was. In other words the mosquitos were developing a resistance to the poison; and that was observed all over the world by about the same time I reported it to the World Health Organization in the annual international meeting in India at that time.

We proved by malarial metric evidence that DDT was losing its killing power against mosquitos, and they were becoming resistant to it. We started another insecticide, Dieldrin. That lasted for a couple of years, and pretty much replaced DDT in this as well. And then towards the end of this study, Dieldrin was becoming less effective.

Hicke: Towards the end of the ten years?

Daggy: Yes. That's about the time I left Arabia and some of the other people took over, and then some of the World Health Organization people took over the spray program, and the Saudi Arab government took over some of it as well. That's about the time I left to come to Harvard.

Hicke: I think it was Elinor [Nichols] who told me about the fish that you threw into the wells. I think that's pretty novel. Can you tell me about that?

Daggy: There was some type of small fish in all the wells and streams in the oasis, little, tiny fish, *Gambusia*.

Hicke: About an inch long?

Daggy: Yes, little, tiny things. So we moved some of those. They were in the wells, and the wells would carry the water and the fish out to the streams and to the irrigation ditches and so on. And sometimes of course, the fish wouldn't cross over into the drainage ditches. If the water was coming out like this and then

being absorbed over here, sometimes there wouldn't be a direct connection with the water. We spread a lot of fish in there.

Then there was another oasis farther inland near Riyadh which did not have any of these fish whatsoever; we never discovered any of them. We moved some of them from the Qatif area into the Riyadh area, from the coastal area into the inland area, and dumped some of them into--there were a number of enormous, big wells that pumped water out into the irrigation fields. We dumped some of those fish into those wells and distributed them that way; and then we distributed some of them in the drainage ditches as well. As far as I know they're still in there.

Hicke: That's what Elinor was telling me; she said she went back with you to one of those wells near Riyadh once. And you asked some boys that were diving into the well if the fish were still there, and they said yes. But how did you know these fish were--what were they doing, eating the mosquitos?

Daggy: Yes. There were a lot of these fish--*Gambusia* is one that we use in this country a lot--little, tiny fish that grow no bigger than that, being full grown. They feed on mosquito larvae almost entirely.

Hicke: That was known?

Daggy: That's known all over the world.

Hicke: I see.

Daggy: I had introduced some of those into the New Hebrides during malaria control work with the navy.

Hicke: Brought them from someplace else?

Daggy: Yes, I think we brought them from Australia or New Zealand, but they're worldwide.

Hicke: Are there any anecdotes or stories that you recall in your travels out to the villages in Saudi Arabia?

Daggy: Most of the houses in those days were very poor, thatched huts. Foreigners normally didn't get into these. But when I was inspecting some of the work to see if they were doing proper spray application on the walls and ceilings, I remember an old woman who didn't want to be taken out of the house; so they put a big basket over her head and left her alone in the back while they sprayed the roof and ceiling.

Hicke: Did she survive?

Daggy: Oh yes, she survived, she had her wits, but she'd probably never seen an American before.

Hicke: Yes, sure.

Daggy: There were so many stories; I was there from 1946 to 1964.

Hicke: Okay, well let's just keep that in mind as we go along, and if you think of any, we'll include them. About two years after you were there [1949], you became the superintendent of the Preventive Medicine Division; so did you have things other than malaria to worry about then?

Daggy: The original charge was to do malaria control spraying entirely, and as I told you, the malaria was not a problem in the company towns. It was a program entirely in the villages, and obviously most of the villagers did not work for the company, so the general public derived most of the benefits from the spray program. Some of the employees who worked for the company benefited, then some of their children and wives and dependents benefited, but it was primarily a program for the villages and the oases. And as I told you before, the Aramco camps were not put in the villages primarily for this reason. Well probably, not only for that reason alone.

Hicke: Anyway, they were free of malaria.

Daggy: They were free, most of them never heard of malaria, never came in contact with it.

Meeting the King##

Hicke: Did you ever have any meetings with the king or any kind of relationship with members of the court?

Daggy: Yes, actually we did visit the king once. In the early 1950s when we first started the malaria program, 'Abd al-'Aziz knew about the program and invited us to come and spray the palaces. They just had mud brick houses then. And so we went to Riyadh and brought our spray crew in. At that time you had to have permission of the king to travel to Riyadh and if you did, you had to wear Arab dress of course. The king sent a whole outfit to me of the robes, which I wore, and I was invited to the majlis.

The drill was that you dressed in the Arab dress, and the king was seated on a low dais, surrounded by a line of guards with embroidered cloaks, and we sat there and we chatted a bit, through the interpreter of course. Then the king started hearing petitions; and in the majlis, any subject might come before the king with a petition to be heard and it would be granted or not granted. During this period, Crown Prince Saud came forward to kiss his father's hand, and he sat right at our feet on the floor. We were sitting at the king's right hand; I was on a low chair, and the crown prince came and sat at my feet, although swordsmen and others were sitting on the floor also. So then we chatted a while more and the audience was complete.

After that we worked in the palace for seven or eight days spraying the rooms, and at that time I learned my first lesson in slavery. The slaves there in the court were fat, well dressed, usually black, and rather sassy; they were drinking coffee, and the free men had to wait until they were ready to have their walls sprayed.

Most of the lower quarters were animal quarters, camel stables and so forth. I remember one occasion in Hofuf the camel herder said that the amir wanted to have the camel stables sprayed with DDT for ticks. They were like bedbugs, they were all over everything. If you came in and stamped your feet on the ground, it would sound like the camels and it'd bring the ticks right out of the ground. But the main spraying in Riyadh was for flies, because the king wanted to see the effect on flies; they didn't really have malaria mosquitos.

I was also called to Jiddah one time when there was an outbreak of malaria up and down the coast, and we did a survey along the coast where the African mosquitos had transmitted a different kind of malaria, and at that time we met Faisal, who was then viceroy of the Hijaz, later King Faisal. He was interested in our work and he came to see what we were doing. So all in all, I met three kings, 'Abd al-'Aziz, Saud, and Faisal.

Other Preventive Medicine Programs##

Smallpox

Hicke: Besides malaria, I believe you started other preventive medicine programs?

Daggy: It started out that the medical director asked me to begin preparing for other preventive medicine activity, public health activity.

Hicke: Who was the medical director then?

Daggy: Well, I had several: Dr. [T.C.] Alexander was the one who was the first director I'd reported to when I came out. He was succeeded by Dr. Page. And then Dr. Page left and I succeeded him. Dr. [Richard] Handschin, did you talk to him by any chance?

Hicke: Not yet, but I'm going to.

Daggy: Dr. Handschin then succeeded me when I came to Harvard, and Dr.--

Hicke: [Julius] Taylor was in there?

Daggy: Dr. Taylor came thereafter.

Hicke: Okay, and I interrupted you when you were just telling me that the medical director asked you to--

Daggy: Yes, so he suggested that malaria was only one of the many, many, many problems. Tuberculosis and trachoma, oh gosh, we had smallpox outbreaks and things like that. I can remember one of the cases: There was a pilgrimage up into Iraq I think it was; a group of Muslims would go every year for the pilgrimage. This was a good place of course to spread smallpox. So these pilgrims came home to one of the small villages up near Ras Tanura, and we learned that there was a possible outbreak of smallpox in this small village. This had been one of the villages where we had done some of our malaria work, so we were known to them, for we had just done malaria work.

Hicke: This was Ras Tanura?

Daggy: Well, near Ras Tanura: Safwa. Apparently one of the children had come down with smallpox en route from a pilgrimage site in Iraq, had died en route, and they brought the body back into Safwa. But then we heard there had been some additional cases of smallpox in the area, and this is only fifteen, twenty miles away. I couldn't imagine that they wouldn't have asked for help from the government or from somebody for a smallpox epidemic! The world would be on fire if we had smallpox around here.

I was asked to go up and investigate, because I had previous experience with malaria control group. So I went up and sure enough, I found I'd see women on doorsteps cradling pock-marked babies. Terrible, and of course it was being spread all over the

place. I'll never forget these blistered, black-faced babies; it was amazing. I said, Oh well, it'll be simple enough. We'll get a smallpox film: One of these films that had been made for the pan-American audiences. They were for backward countries for health education tools. I had arranged for one of these to be sent out by air, I guess, and said, We'll take this film up and put a sheet up in the town square, show the film on smallpox control, and then we'll have a chance to talk to them about it, and so on. I had planned all this, and I thought there could be no possible objection to this.

So someone said, You're going to talk to the Government Relations Department, are you not? The Government Relations Department was in charge of all government contacts. They said, We're not sure that you'll be allowed to do that. And I said, Of course I will. (I was naive then.) If people are dying of smallpox, you do what you can to prevent it. They said, Well, you'd better see the local governor about this.

So we did, and he said, No, there will be no health education films shown on smallpox. If God had not wanted smallpox visited on the population, he would not have sent it to the population. All these educational films were verboten; he didn't want just any kinds of films. The amir enjoyed war pictures and battleship pictures. No entertainment film and no educational film, nothing of this sort. I said, Oh my God, I can't believe this!

Then we showed him this picture I guess of a film made in South America. These were some Walt Disney films that were made some time ago, years and years ago. We took these films up and showed them, finally got permission to show them on the screen in the village. Later we sent up a vaccination team for smallpox vaccination, and then they got the epidemic under control.

I started to say that the film was not a big success, because what these people were looking at were woods and streams--like in South America--the rivers and all the green, green grass, and green trees and crops and so on; and of course they lived in a sand pit really, in the middle of the desert, in a desert village.

Hicke: They couldn't relate to that.

Daggy: They couldn't relate to the rushing streams and lakes and pools and so on, green grass and green trees and things like that; they were looking at the background rather than the lesson of the story.

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Hicke: Were those the only cases of smallpox you saw?

Daggy: Yes, that was the last outbreak that we saw.

Hicke: Bill Taylor said he saw some.

Daggy: Yes.

Looking for a Trachoma Vaccine

Hicke: What other kinds of preventive health things did you do?

Daggy: Well, we tried to develop a vaccine for trachoma.

Hicke: Yes, Elinor told me a lot about that, so did Dotty McComb.

Daggy: Dr. Snyder--you've got a kind of deposition from Snyder, I think; did you see him?

Hicke: He sent some materials but I haven't gotten it yet; he sent it to Phil [Gelpi]. But I know he has a lot to offer about that too. Let me just ask you what you had to do with that project. Tell me what you knew about it, from your own viewpoint.

Daggy: Well, I had little to do with the trachoma project except to ease the way. I was medical director at that time, chief of Preventive Medicine anyway. All that was a Harvard research program.

Hicke: I'm interested to know exactly how it got started. I guess it got started with Dr. Snyder coming out?

Daggy: Yes. I had gone to the Harvard School of Public Health to take a Master of Public Health, because by that time [1952], as I was telling you, some of this kind of work was going above and beyond the malaria control project.

Public Health Program

Daggy: They asked me to head up a preventive medicine program, a public health program.

Hicke: Aramco did?

Daggy: Aramco did.

Hicke: They didn't have one before?

Daggy: No, Aramco Medical Department soon found out that as they were treating patients, the more they were treating them, the more they got. There was no preventive program, no vaccination program for the dependents; in those days you could hardly get a Saudi employee into the hospital. In the early days he'd avoid the hospital like the plague; hospital was the place to die, like the old times in this country.

I asked that I go to the Harvard School of Public Health for a six-month period and then perhaps come back for my next biannual visit to finish it up. So I went and took courses in maternal and child health and epidemiology and statistics, tropical public health, tropical medicine, sanitary engineering, and things like that. Then at the end, I fully expected to come back at midterm.

Dr. Ted Allen had been at the Harvard School of Public Health at the end of the war. He suggested that I go there to the School of Public Health, and then the dean, Dean Simmons, had been an army chief of preventive medicine during the war, and he had become dean of the School of Public Health a year or two before. He talked to Dr. Allen on a visit, saying that he thought it would be insane for me to leave in midterm and pick up two years later. Ted Allen asked whether I would be willing to stay. Yes, of course I would be willing to stay; but if I'm gone for three or four months and ask to stay nine, they can probably do without me for quite a long time! [laughter] So I said, "Well you can ask but I don't think it will do any good." And then after he was gone, I thought, My gosh, this is--enough's enough. I'm asking to stay at the School of Public Health for the rest of the semester? If they can do without me this long, they can do without me for good.

But to my great surprise, they put me on the stateside payroll and told me to stay; and then I took the master of public health at that time. That led to all the other public health activities, preventive medicine activities of the time. We added a health educator to the group; we added sanitary engineers; I got another entomologist, epidemiologist, maternal and child health specialists. We established the nucleus of a public health program, actually, and then we began working on programs in addition to malaria.

Some of those were not only for the Saudi employees but were for some other kinds of preventive problems within the general populace, Americans as well as local. They had quite a few

problems with amoebic dysentery, for example, infectious hepatitis, a number of things. We had food and restaurant programs. We had sanitarians, and we developed a small public health program: health education, environmental health and sanitation,--to prevent diarrhea, malnutrition, skin infections--special care of premature infants.

I might give you this, I've got an extra copy of this: prenatal care, proper feeding for children, there's maternal child health specialists and so on.¹

Hicke: I think we're going to deposit some papers in the library at Berkeley to go along with the oral history, so if you have a copy of that or any other papers that eventually we could have, that would be excellent. Was it a fairly unusual thing for an offshore corporation to develop this kind of program?

Daggy: I think it was an entirely new thing. I don't know of a single similar case that has occurred.

Hicke: Do you have any sense of why Aramco?

Daggy: Well, yes. I think they had a sense of responsibility to their employees, not only to their American employees but also to their Saudi employees. And the Saudi employees for the most part lived in the nearby villages; or if they came from a farther distant area, they lived in the [Aramco] camps. Sometimes even in the camp they would have to be brought in against their will because they were sick. The dependents were of course in the villages. For a time they did not come in for any kind of treatment; so there was a big backlog of treatment in one of the most undeveloped parts of the world.

Gradually it improved, with health education, with maternal and child health assistance, with care, with nursing. This was primarily a male-dominated area. Then some of the female dependents and kids came in. The Saudi employees, their wives and children, if they came in to the hospital, got treatment; but it was rough getting them in, in the beginning. Soon the flood was on, and you couldn't keep them out, in a sense. I once told management that if this kept up, they were going to have a huge medical department attached to a little oil company. It was growing by leaps and bounds. We had about 12,000 Saudi employees, and each one had one or two wives and a set of children. That

¹Richard H. Daggy and R.C. Page, "Aramco's Preventive Medicine Program," *The Medical Bulletin*, 16: 196-204, 1956. Standard Oil Co. (N.J.), New York, N.Y.

quickly added up: in addition to 3,000 Americans, we had 12-15,000 Saudi employees and 12-15,000 Saudis' wives and kids. It was overwhelming.

So we started out trying to work with the World Health Organization and trying to get the Saudi Arab government, who had begun to take some interest in the hospitals and the clinics, to organize some preventive medicine programs in the towns and villages nearby. Aramco could draw people in; but once all the nonemployee dependents, as well as the employee dependents, started coming in--anyone could come in for medical care--so once we had gotten to the point where the knowledge that medical care was something that the employees learned to appreciate, then their wives and families came to appreciate it. And then not only their wives and families came in but everyone else came in for medical care. So that's when we started trying to point out that the Saudi Arab government must take responsibility at least for their own people.

Hicke: The people who weren't Aramco..

Daggy: Those who weren't Aramco and had no association with Aramco.

Hicke: Was there somebody in the Aramco management that you think was particularly supportive?

Daggy: Oh yes. I think Tom Barger was. He was a geologist who came out originally, way back before my time; he is long since dead. Many of these older employees had a very strong appreciation for the Arab and for their character and culture. They were truly appreciative; they had been on exploration parties, of course with Arab guides in the exploration of Saudi Arabia; and they had appreciated the men of the desert, if you will. I learned to respect them and appreciate them. Those early explorers had a lot of respect for the Arab. They tried to do what they could for them. There was a whole big program of worker education--schools, even grade schools in the villages. There was only one high school in the whole area when I first came. Since then there have been high schools and colleges and universities that have gone ahead.

So there was a whole development program in addition to the medical program: educational program, road development, urban industrial development; they tried to get people started in various businesses and so on.

Hicke: I don't want to keep you too much longer, but let me ask you if there are some things that we haven't covered, that we should talk

about. Maybe you could tell me a bit about people you worked with, like you had mentioned Dr. Mitch Owens.

Daggy: Yes. He was a health educator, and I think you'd be able to get more information from Dick Handschin; he may know where he is located.

Hicke: When did he arrive and how did you get him?

Daggy: After I came back from the Harvard School of Public Health the first time, with my master's degree in health education, I felt we needed a health educator, and we hired one.

Hicke: He was in charge of programs?

Daggy: Yes, this describes his activities.

Hicke: *The Administration of Medical Care and Health Services by Aramco in Saudi Arabia*, by Richard H. Daggy.¹ Was there anybody else that you recall particularly that worked on this program?

Daggy: The Maternal and Child Health nurse, MCH nurse, and again Handschin will be able to tell you about her. I can't even remember her name. This was about the time I left.

¹From *The Medical Bulletin*, 64:1-23, March 1964. Standard Oil Co. (N.J.) New York, N.Y.

IV WORK AFTER ARAMCO

Associate Dean, Harvard School of Public Health

- Hicke: Well then, I'd like to hear how you decided to leave and how you wound things up, turned over the preventive health program to somebody else.
- Daggy: Well, I should tell you, I didn't want to leave.
- Hicke: I think that's not unusual; a lot of people I've talked to didn't want to leave.
- Daggy: I was kind of forced into it. Dean Snyder had assumed that I was going to come at age fifty, taking early retirement.
- Hicke: Come to Boston where he was?
- Daggy: Come to Boston, yes, and take a post in the School of Public Health as associate dean. I finally agreed to it. Remember I think I told you that--
- Hicke: You didn't tell me on the tape though. We were just talking when we were having lunch, so I'm asking you to repeat that story on the tape. What you started to tell me at lunch was that every time you saw him, he had said that--
- Daggy: Yes, shortly before my fiftieth birthday, Dr. Snyder was out in the field, and he had asked when I was coming back. I said I didn't know and I wanted to stay at least until I was age fifty and eligible for early retirement. I had no real reason for coming back, and I thought he was interested in helping me get relocated if I ever decided to come back. I indicated that I was not going to come back at the earliest until age fifty, so that I could be eligible for early retirement.

I didn't know at the time that he was thinking of a post at Harvard, I just thought he was thinking in terms of a responsible school looking for assignments of its graduates, someplace. When I learned that he was thinking in terms of my coming to Harvard, I was very surprised. I said, Well, I guess coming back to Harvard University is no mean place to begin. So I had asked for a leave of absence and then I'd been home just about that time on vacation, and I talked to my father about it. My father said, You aren't going to hold up everyone along the chain of command, are you, waiting a year while you can make up your mind? I thought that was a strong way of putting it, but he was right. Dr. Handschin would have been waiting a year just for me to make up my mind, and other people were there. I decided that was not the thing to do, and that if I was going to go, I should go, and if I was going to stay, I should stay. When I finally decided, I thanked the administration for their willingness to give me a year's leave of absence, but I said, No, I've got to make up my mind. So then I came back to pick up the post at Harvard.

Hicke: This is '64.

Daggy: I retired in December '64. So then I came back, but I continued my association with the Harvard-Aramco trachoma research team and my interest in Saudi Arabia up to the present.

University Associates

Hicke: Weren't you part of the University Associates? Maybe you can tell me about your part in that too.

Daggy: Oh yes. Well, Dr. [Roger] Nichols thought it would be helpful to Saudi Arabia to have a kind of a consultant group. He suggested faculty members: the dean of the faculty at American University of Beirut and the head of the Department of Tropical Public Health at Johns Hopkins University and himself and myself at Harvard. That was after I had retired from Harvard, partially retired anyway, not active anymore. We went out to review and to make recommendations on the long-term study, long-term project for the Ministry of Health.

I had just built this house, and a friend of mine was staying in it who had also been in Saudi Arabia. He had a heart attack while living in the house with a friend, and I had to come home; I had the dog and the house and everything else to take care of. So I came home about that time. I prepared some of the reports, but the main work was with Dr. Nichols and Elinor, Dotty

McComb, and that group. They had some additional programs in Qatar, I think, in the Arabian peninsula, in addition to Saudi Arabia, consultant activities. But I did not participate; my time was cut short because I had to get back to the house.

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Hicke: So that's it for University Associates?

Daggy: Yes, pretty much. Elinor would have told you more about that.

Hicke: Yes, she did tell me a lot.

Some Statistics and Evident Changes

Hicke: Okay, anything else that we should cover?

Daggy: I guess I can't think of anything. I'll probably think of something as soon as you go. For example, we had 10,000 employees and 9,000 wives, 29,000 kids in Saudi Arabia at that time.

Hicke: That's pretty impressive!

Daggy: These are all in here, these figures--the general health status in 1949, '59, '69, '79, '89. Thirty years ago 10 percent had physical defects, and 11 percent were unfit for employment; 87 percent underweight. Serious disease, intestinal worms, trachoma. dysentery, malaria, tuberculosis.

Hicke: What about worms, did you do anything about worms?

Daggy: We tried to improve sanitary food and water supplies, health education, that kind of thing. Oh, the Ministry of Health Cooperative project--I told you that we attempted to get the Ministry of Health to stand on its own two feet with the help of the World Health Organization.

Hicke: You must have gotten them interested, because I know they built a huge hospital and a lot of small hospitals even in outlying areas, so I think you must have been convincing.

Daggy: This was about the time I left.

Hicke: I think we've covered most of what I wanted to ask; it's been a very informative interview, and I thank you very much.

Daggy: Well, you're most welcome.

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Aramco Medical Department Oral History Project

Armand P. Gelpi, M.D.

ARAMCO MEDICAL SERVICES: 1959-1969

Interviews Conducted by
Carole Hicke
in 1995 and 1996

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Armand P. Gelpi.

Photograph by Elson-Alexandre, Los Angeles

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INTRODUCTION--Armand P. Gelpi, M.D.

Dr. Gelpi joined Aramco from a California private medical practice in 1959 as a board-certified internist. Assigned to the medical staff at Dhahran Health Center, he took over the newly created Medical Services Unit composed of Internal Medicine, General Practice, and Pediatrics. During his eight years of service as a full-time Aramco employee in Saudi Arabia, he balanced his clinical activities with medical research and administration. The years with Aramco, in Dhahran, were enriching for Gelpi and his family--so much so that his son, Peter, went back for a few years of employment with Aramco before heading to business school. For the Gelpi family, where tennis and water sports left off there was prospecting for archaeological artifacts and travel to other Middle East countries.

Resigning from Aramco in 1969, after a year's sabbatical at Stanford, Dr. Gelpi returned annually to Dhahran, beginning in 1974, to complete research projects begun earlier. From 1974 through 1978 he conducted summer research, mentoring college students in laboratory technique and field epidemiology, and provided *locum tenens* support for Internal Medicine. His last visit was in 1981, for clinical service only.

His stateside medical career has spanned employment as assistant medical director at the Stanford Student Health Service, faculty at Stanford Medical Center, part-time staff at Palo Alto and Menlo Park VA medical centers, and more recently, staff physician in occupational health at the National Aerospace Administration's research center in Mountain View, California. He and his wife Lou now live in Sonoma, California.

Armand P. Gelpi, M.D.

December 9, 1997
Sonoma, California

INTERVIEW HISTORY--A. P. [Phil] Gelpi, M.D.

Dr. Phil Gelpi joined Aramco in 1959 as an internist and spent ten years with the company in Saudi Arabia. Soon becoming chief of medicine, he supervised the internal medicine, pediatrics, and general practice services. This gave him both medical and administrative duties, which he describes in detail. He discusses the village clinics in Abqaiq and Ras Tanura, and the arrangements with contract hospitals, which he supervised as liaison officer for Medical Services. His patients, both Arab and American; other members of the diverse medical staff; and relations with company management and with Saudi government officials.

Dividing his time among his various duties proved to be a considerable challenge--Gelpi estimates 25 percent of his time went to administration, 25 percent to clinical practice, 25 percent to teaching, and 25 percent to research. He instituted a medical journal club that met regularly to review articles and exchange information.

Discussing his cases and diseases being treated, Gelpi covers smallpox, malaria, trachoma, Q fever, pulmonary ascariasis, cancer, sickle cell disease, schistosomiasis, tuberculosis, and hepatitis.

Gelpi was interviewed at his home in Sonoma, California, on December 3, 1995, and January 2 and February 5, 1996. He had prepared extensively with notes and written essays on his work in Saudi Arabia. Instead of correcting the draft transcript, he chose to rewrite most of it, thus producing a somewhat formal document but one offering much information in a clear and concise manner.

Carole Hicke
Project Director

January 1997
Regional Oral History Office
University of California, Berkeley

I BACKGROUND

[Interview 1: December 3, 1995]

Growing Up in Denver and California

Hicke: Let me start this morning by asking when and where you were born, and where you grew up.

Gelpi: I was born in Denver, Colorado, in 1925, grew up in Denver, and moved with my mother to California in 1939. My father remained in Denver.

Hicke: And you went to school there?

Gelpi: I started high school in La Jolla, a town in southern California just north of San Diego. My mother and I remained two years in La Jolla and then moved to Beverly Hills.

Hicke: What particular subjects did you like in high school?

Gelpi: I was interested in science and math primarily; but I think I had a fairly balanced high school education. I was particularly interested in chemistry, and actually considered becoming a chemist at one point during high school. This changed with the advent of World War II, when the opportunity appeared to enlist in an officers' training program offered by the navy for college students who would ultimately serve as lawyers, doctors, and supply officers in the navy.

Pre-med Training in the U.S. Navy, 1943-1945

Hicke: So you joined the navy?

Gelpi: I joined in 1943 and was sent to the University of Texas for both military training and undergraduate college education in the V-12 program (similar to the army's officer's training program, and today's ROTC). I completed almost four years of college, compressed into six semesters, spanning two years.

Hicke: You got college credit?

Gelpi: I got full college credit; and then for a brief period I was assigned to a navy hospital in Norman, Oklahoma, pending my admission to medical school, which turned out to be the University of California Medical School in San Francisco.

Hicke: What kind of courses were you taking in the V-12 program?

Gelpi: Well, there was a standard pre-med curriculum, which is heavy on science, not so heavy on math, and relatively weak on liberal arts, but it turned out that there were enough electives so that I got a fairly balanced liberal arts program. We had additional navy training designed for officer candidates, which included naval history, naval rules and regulations, military drill, daily morning calisthenics, and an intensive additional program of physical education for an hour a day, five days a week. It is the sort of exacting program you might expect at Annapolis, the Air Force Academy, or West Point.

Hicke: Let me back up a little bit. When did you decide you wanted to be a physician?

Gelpi: By my senior year in high school I had just about decided to be a physician. I knew that I was not only interested in the science of medicine, but it appeared that medicine offered me an opportunity to deal with people as well as with ideas and issues. So I ultimately decided that going into medicine would meet all my objectives, including science and the need also to have some kind of personal contacts in my work.

Hicke: Did any person inspire you?

Gelpi: Not really. My father was a dentist; but I never for a moment considered going into dentistry. I had some uncles on my father's side who were doctors, but I had virtually no contact with them. So they really didn't influence me. My mother was probably more influential than anyone, simply because she was looking at

medicine as an avenue to a comfortable income, social status, and other benefits which seem to be acceptable reasons for parents to propel their children into medicine and other professions.

Hicke: So then when you joined the navy you specifically requested a pre-med program?

Gelpi: There were specific undergraduate programs for pre-meds, engineers, officers destined for the supply corps, naval law, and for naval aviation. The V-12 program included special training for all those students who were not destined to become line officers (those who would be involved in the operation of naval vessels and/or combat activities) or navy pilots. There were probably several thousands of young men in the V-12 program, several hundred of whom were assigned to the University of Texas in Austin, which had one of the largest officer training programs in the country. Of course, the idea was to quickly build a pool of officer specialists to meet the expanding needs of the navy beyond the customary supply of career officers from Annapolis. At the time the program was initiated, no one could have foreseen how long the war would last and how much attrition there would be among officers on active duty. So the navy planned to continue their specialist officers' training programs indefinitely.

Hicke: And when you went to the navy hospital in Norman, what were you doing there?

Gelpi: I was a hospital corpsman. Corpsmen fulfilled a role that today is shared by people like nurses' assistants, paramedics, physicians' assistants, and emergency medical technicians, who are attached to fire departments. The navy still has a place for corpsmen, and presumably their duties are roughly the same.

Medical School

Hicke: And then you wanted to go to the University of California?

Gelpi: All of us who were waiting for admission to medical school as officer candidates and those civilians enrolled in conventional pre-med programs were ultimately brought before a "Deans' Committee," which as the name might suggest was made up of a panel of deans from a number of medical schools throughout the country. This panel would have reviewed the candidates' curricula and grade point average, and then following a half-hour interview make a decision about eligibility for medical school. And based partly upon the choices among medical schools expressed by the applicant,

the academic standing of each applicant, and the availability of first-year slots within the pool of medical schools accepting officer candidates, the applicant might get his first choice. I was accepted at the University of California; and this happened to be, for various reasons, my first choice.

Hicke: At the University of California, would you be still in the navy?

Gelpi: Still in the navy. We remained on active duty until the spring of 1946, that is, several months after the war ended. Once relieved from active duty status in the military, we were obligated to remain in the naval reserve--which most of us did for several years.

Hicke: When did you begin work at the University of California?

Gelpi: I started in September of 1945, graduating in July of 1949. Our first year of medical school was in Berkeley, and the following clinical years in San Francisco.

Hicke: When did you get married?

Gelpi: I married in 1952, during the Korean War while serving with the U.S. Marine Corps as a naval medical officer.

Hicke: What is your wife's maiden name?

Gelpi: Lucille Dachos.

Hicke: Okay, back to medical school. Were there any particularly memorable experiences that you had?

Gelpi: Yes, there were. I found the first year of school to be extremely tedious and more difficult than I had anticipated. I had sailed through the arduous premedical program at the University of Texas and was not used to working as hard as I had to in order to obtain acceptable grades in the first year of medical school. It wasn't until my second year that I really became enthusiastic about school. The first summer--that is, between my freshman and sophomore years--I spent in Austin, Texas, at the University of Texas getting some extra liberal arts credits.

Hicke: Do medical students get much in the way of liberal arts courses?

Gelpi: Most of us felt deprived, particularly if we were involved in accelerated programs of the sort offered by the navy, in which science was emphasized at the expense of the humanities. And I think nothing much has really changed. There is a lot of pious deliberation among medical educators about a broad education for

today's physicians, but I think they are just blowing smoke rings. The schools don't want a change. And of course pre-med students are furiously competitive, trying to pile on as much science as they can, and get the best grades, knowing that this will make the difference between acceptance and rejection from the schools of their choice.

Hicke: Then did you continue any of your interest in the liberal arts? Obviously you didn't have time to do much.

Gelpi: I had really been stimulated by a couple of teachers at the University of Texas. One taught a class in modern English literature; the other offered a course in philosophy. I'm still quite interested in modern English literature, particularly the world of short stories. I enjoy poetry. But I am perhaps most interested in expository writing in the areas of history, politics, international relations, and economics.

Internship and Military Service During the Korean War

Hicke: What happened in 1949?

Gelpi: I graduated from medical school and interned at the Santa Clara County Hospital in San Jose, California.

Hicke: Does anything stand out from that period?

Gelpi: This was a plunge from formal training into the real world of "hands-on" medicine, and this was quite an experience. In those days we had what is termed a rotating internship, which took the medical school graduate through month-long practical rotations in general medicine, pediatrics, obstetrics, gynecology, surgery, and so on. The idea was to lay the foundation of broad clinical experience, either for the generalist or the specialist, by exposure to all of the specialties.

Hicke: When you say "generalist," do you mean a general practitioner?

Gelpi: Yes. But in the forties and fifties, surgeons, pediatricians, internists, and specialists in obstetrics and gynecology were to a certain extent generalists because these specialists had--and many still have--a broad range of interests and clinical skills. It's really only recently that subspecialties have proliferated to such a great extent.

Hicke: What were you heading for?

Gelpi: I was definitely heading for internal medicine. As I progressed through medical school, I found that I was more and more attracted to this specialty. It seemed to me that internal medicine offered the greatest opportunity for developing diagnostic skills and for pursuing medical research. But I enjoyed pediatrics a lot as a medical student, and was encouraged by the department chairman at UCSF to take postgraduate training in pediatrics. But my first love was, and still is, internal medicine, and so I sought a residency in internal medicine.

Hicke: Did you say you spent a year in internship?

Gelpi: I spent a year, and then was called to active duty in the navy, spending two years in military service. This was to pay my debt to the U.S. government for V-12 training during World War II. I spent two years as a navy medical officer, partly with the navy in San Diego and partly with the marine corps at Camp Pendleton, California, and at the marine corps cold weather training camp in the eastern Sierras. My service in San Diego with the navy was at the navy reception center for recruits.

Hicke: So at the reception center you were examining...?

Gelpi: I was examining reservists who had been called to active duty, mostly for assignment to sea duty on ships supporting military activities in Korea. For reasons which are unclear to me even today, I eventually became psychiatrist for the receiving center in San Diego.

Hicke: What did that involve?

Gelpi: To some extent, it involved trying to work with people who found themselves rather upset by the prospects of being sent overseas and exposed to combat conditions. In addition, my job included evaluating enlisted men who had declared themselves to be homosexual or who were thought to be homosexual by others, in order to obtain psychiatric documentation of their sexual orientation. I was supposed to have a close liaison with the naval secret service, which, among its other tasks, was tracking down suspected homosexuals. Homosexuals were then and today believed to undermine morale--particularly in close quarters, under crowded conditions existing on board ships.

Hicke: I wanted to go back to one thing. You said you were interested in the detective aspects of internal medicine, and I suspect that has something to do with your research in Saudi Arabia. Am I right?

Gelpi: Well, eventually it did.

Hicke: I don't want to get into that right now. I just want to find out how this interest grew.

Gelpi: It matured in Saudi Arabia.

Hicke: Yes, but did you develop that in your reading? Do you remember how that started out?

Gelpi: In most medical schools, the role models for medical students are not clinicians in the sense of people engaged in direct patient care, but people who really have a career devoted to research, teaching, or both. So this influences some medical school graduates; and it certainly affected me to a certain extent, and probably was in part responsible for my later interest in research. But I was really torn between a career in community medical practice and clinical investigation. When I went to Saudi Arabia, I was fortunate enough to do both--I thought, fairly well.

Hicke: Then when you were up at the cold weather training establishment in the Sierras, what were you doing?

Gelpi: I was there for three months with a cold weather training battalion. The program was designed by the marine corps to prepare personnel for the rigors of Korea in the wintertime. We were camped in a place where temperatures would often drop to ten or twenty degrees below zero in midwinter--comparable to what troops might experience in Korea during the winter months. There were casualties, not unexpected among unseasoned marines in a cold weather environment. As a physician, I was at this camp to deal with the usual medical needs of military personnel, but also with injuries due to dampness and cold. We had a couple of near disasters, but no deaths nor serious cold-induced injuries during my tour of duty.

Hicke: Did you also participate in training troops to avoid the effects of cold?

Gelpi: Sure. The idea was to teach the troops how to obtain the maximum benefits from protective clothing, how to avoid excessive exposure, and what to do with damp clothing in rapidly changing temperatures. We wanted to teach the men the dangers of imbibing alcohol under cold weather conditions, how to avoid frost-bite to areas of the body which were necessarily exposed to the elements, and how to avoid hypothermia.

Hicke: I'm not sure what year we're up to now.

Gelpi: This would have been the winter of 1951 and early 1952.

Hicke: And then what happened?

Gelpi: I was discharged from the marine corps--

Hicke: Oh, you were in the marine corps?

Gelpi: I was attached to the marine corps as a navy doctor, and I was actually discharged from the navy after two years of service in the spring of 1952.

Residency in San Francisco and San Jose, 1952-1955

Hicke: Then what did you do?

Gelpi: I was preparing for my first year of residency in medicine and had been accepted to the University of California, where I had applied while still in the navy. We (my wife and I) moved to San Francisco. I had a year's residency training under the auspices of UCSF, which included rotations in college health and experimental oncology. My second year's residency was spent entirely at San Francisco General Hospital on the University of California medical service.

Hicke: Were you still heading toward internal medicine?

Gelpi: All of my residency training was in preparation for internal medicine. My last year of residency training was at Santa Clara County Hospital--now the Santa Clara Valley Medical Center--as chief medical resident. Interestingly, I shared this spot with Dr. Richard Perrine--six months' rotation for each of us--leading to a long professional and social relationship.

Hicke: Did you have something to do with his going to Saudi Arabia?

Gelpi: Actually, I did. He was interested, and made some inquiries shortly after my arrival. I don't know how strongly I encouraged him to join Aramco, but my encouragement may have been important in his decision.

Hicke: When did you finish at Santa Clara County Hospital?

Gelpi: I finished in 1955; and at that point, I was toying with the idea of going into private practice with one of the other physicians in the San Jose Area. But I had also been recruited by UCLA's Department of International Health to carry out a research project on elephantiasis in Tahiti.

Hicke: What happened to that?

Gelpi: We had just had our second child, and my wife developed two consecutive kidney infections. The prospects of going to Tahiti, where I might be the only doctor in the particular area in which I would have to work and would be without the necessary follow-up medical care for my wife, made the UCLA offer less attractive. We had actually purchased our steamship tickets in preparation for departure; but in the end I had to decline the faculty appointment with UCLA and the research assignment in Tahiti.

Practicing Medicine in the V.A. Health Care System

Hicke: What did you do instead?

Gelpi: I had to make some quick decisions about employment; and since I had declined offers from local physicians for association and/or partnership, I had to decide either on solo medical practice or employment with a large medical group, such as existed at that time both in government and the private sector. I selected the Veterans Administration, for reasons which are not clear today, and took a staff position with the V.A. medical center in Fresno, California as a full-time, hospital-based internist.

Hicke: What did this involve?

Gelpi: It consisted of practicing as an internist, which is what I had been trained for, in a well-equipped hospital which had about 200 beds. I remained in Fresno for a little less than two years, and then transferred to the V.A. Medical Center in San Francisco, where I had been offered a fellowship in oncology and hematology--cancer and blood diseases.

Hicke: Were you doing research?

Gelpi: Mostly research, but my appointment also included some clinical responsibilities, which provided additional training and experience in the diagnosis and treatment of certain cancers and blood diseases. I held this position for a little more than a year.

Hicke: What year was this?

Gelpi: This would have been the years 1957-58. At the conclusion of the fellowship I decided for various reasons to go into community practice. On the other hand, I had been appointed, during the

fellowship, as a career clinical investigator with the Veterans Administration. There was a conflict between me and the chief of the medical service at the V.A. hospital which would have made it difficult to carry on independent research and contribute to the teaching program in oncology and hematology at San Francisco's V.A. hospital. I was thus leaving a hostile environment and entering private practice.

Private Medical Practice

Hicke: Where did that take you?

Gelpi: I went to San Leandro, California, on the invitation of two older doctors who were looking for an eager, young associate. The relationship was satisfactory, up to a point, and that was when I found out that one of my associates was an alcoholic. I was obliged to think seriously about a new association, or solo practice. Fortunately a couple of local colleagues were quite interested in having me, which would have made it easy to withdraw from the short-term association in which I was established.

II EMPLOYMENT WITH ARAMCO, 1959

Job Interview

Gelpi: But then something unusual happened. One day I was scanning the "wanted" pages of the Journal of the American Medical Association and came across a notice that the Arabian American Oil Company was seeking an internist for its health care program in Saudi Arabia. At the time, I thought that maybe this would be a chance to become more involved in international health, which had been my early intention when I was considering the position with UCLA, and to continue to practice medicine in my specialty. So I responded with a letter, which I believe was addressed to Aramco's New York office--Aramco's U.S. headquarters at the time. I didn't get a letter back; I got a phone call advising me that the director of Aramco's medical services in Saudi Arabia just happened to be in the U.S.A., and that he would be coming to San Francisco to interview me. Thus began a long and fruitful relationship with Aramco and its health care program.

Hicke: Tell me who interviewed you and how that went.

Gelpi: The medical director at that time was Dr. Robert Page--long since retired. The interview seemed to go well, and a few days later I got a summons from the New York office saying they were interested in employing me and advising me to get my affairs in order for an early departure to Saudi Arabia.

Hicke: Oh, a job offer that soon?

Gelpi: Yes.

Hicke: What had they told you about your prospective duties?

Gelpi: They sketched out some of the responsibilities of the job, with the implication that I would be doing pretty much what I had been

doing in the United States, that I would be able to work within my specialty, and that I would be assigned to the main Aramco medical facility in Dhahran. There I would be joining a group of mostly American-trained doctors working at Dhahran Health Center. However, I knew little about the range of diseases I would encounter; but I knew I would be responsible for the medical care of American and European expatriates and their families as well as Saudis and expatriates from other Arab countries. I anticipated certain diseases which would be expected in developing countries; but here, there was uncertainty because of the very limited published information on health and disease in Saudi Arabia.

Hicke: Had you been able to do any reading about diseases of Saudi Arabia?

Gelpi: I found one relevant article published in the late fifties in a journal of military medicine--a survey of diseases encountered in Saudi Arabia's Eastern Province by a physician attached to the U.S. military mission [United States Military Advisory Group] stationed at Dhahran's airfield. There must have been others, but I didn't know of early publications which might have revealed the types of medical problems indigenous to Saudi Arabia. I presumed that this was a country with plenty of tropical and other exotic diseases. I was not to be disappointed.

But just to be reassured, I insisted on a visit to Dhahran prior to my acceptance of the job offer by Aramco. This was an unprecedented request. Nevertheless, the company agreed, and I made my way to New York at my own expense, then to Dhahran on a company aircraft. This was in the summer of 1959. I spent several days in Saudi Arabia, and was not only able to tour the medical facilities which existed at the time in Dhahran, but also those in the clinics and inpatient facilities at Ras Tanura and Abqaiq--about seventy-five miles north and south of Dhahran, respectively. Perhaps the decisive part of this visit was an excursion with Dr. Richard Daggy--then head of Preventive Medicine in Dhahran--to one of the large villages in the Qatif oasis. There I saw what I had hoped for--signs of such disease as malaria and trachoma which affect the populations of so many developing countries.

I had a better idea of what I was going to face in Saudi Arabia, and this convinced me that Dhahran and its environs would be good places to practice medicine. I was even more encouraged by the knowledge that I would have a highly sophisticated back-up system in the form of laboratories and imaging facilities of a quality typical of many U.S. medical centers at that time, that I would have colleagues trained in other specialties to work with. That I would be on a medical frontier diagnosing and treating

tropical diseases--not as a missionary doctor, but as a well-trained internist--was an opportunity.

Hicke: How long did you spend in Dhahran on that trip?

Gelpi: Less than a week. But this was enough to convince me to close my medical practice in San Leandro and move with my family to Saudi Arabia. This I did in August of 1959, arriving in Dhahran without my family, which would follow in December of the same year.

The Move to Dhahran, Saudi Arabia

Hicke: You've written a nice description of arriving at the airport in Dhahran in which you said, "It was in late summer that I stepped off a DC 6B airliner on the tarmac--melting, it seemed--at Dhahran airport. Temperatures at that time of year were said to reach 120°F in the afternoon, and this seemed to be one of those afternoons. The airport terminal was simply an open shed for the Saudi customs officials, with a pile of baggage in the center." But what was the trip like? You had very young children, I believe.

Gelpi: I had left Lucille, my wife, with a lot of extra responsibility in disposing of our home and automobiles, getting our personal effects packed and off to Saudi Arabia by boat, and arranging for tickets, passports, luggage, and a minimum of personal effects for her to take to Saudi Arabia for our temporary housing in Dhahran.

Hicke: Did you fly in the Aramco plane?

Gelpi: For many years Aramco had its own fleet of airplanes, a couple of which were turbo-prop aircraft which in most respects would be equivalent to the commercial aircraft of that era making international flights. On my second trip to Dhahran, I took a commercial flight from San Francisco to New York; and then, after an overnight hotel stay, I boarded Aramco's plane bound for Dhahran. There was another overnight stop in Amsterdam, possibly a fuel stop at Beirut, and then on to Dhahran.

Aramco Health Care in Saudi Arabia Before 1959

Hicke: Let me ask you, before we get started on your own activities there, what you can remember hearing about Aramco's medical department before your arrival.

Gelpi: There was a little anecdotal information, most of which I probably soon forgot. At the time, I was looking towards the future--perhaps less interested in the past than I should have been. I'm sure I was given a brief historical summary at the time of my interview in San Francisco, maybe more when I arrived in Dhahran.

Hicke: You indicated off the record that you thought Dr. [T. C.] Alexander was important. Was he still there when you arrived?

Gelpi: I believe that he was just about to retire when I arrived on my first visit. I may have met him then, or a couple of months later, when I made the final move to Saudi Arabia. I was told that he was one of the first physicians to be assigned to Saudi Arabia by Aramco. Actually, during my brief contact with him we did talk some, but I don't remember the details of our conversation. It turns out that he was one of the pioneers of Aramco health care.

Hicke: I've heard that the medical department was originally staffed by Indian physicians. Were there any still there when you arrived?

Gelpi: There were many Indian physicians on the medical staff. Aside from the Americans, they represented a majority. But in addition, there was a handful of Lebanese and Palestinian physicians. There were no Saudis until later.

Hicke: I suppose that the Indians spoke English and that was an advantage. Why else would they have been recruited, do you think?

Gelpi: I don't know exactly why they were recruited in preference to other expatriates, besides Americans. All spoke English; most were from the Indian province of Goa, and most were Christian. The significance of this is not clear but may have to do with the compatibility between Islam and Christianity--Christians, with Jews, being regarded as "people of the Book." And certainly during the early years of Aramco's Medical Department, employability to a certain extent was determined by stated religious preference. There certainly must have been other factors which brought Indian doctors to Saudi Arabia and Aramco. There has long been a drain of highly trained professionals from India because of adverse economic and social conditions; and



Exterior view of Dhahran Hospital late 1940s. Now it's the Women's Exchange Office. Dhahran main camp.

Photograph courtesy Saudi Aramco Archives

Indian physicians were well represented in places like Africa, and more recently in the United States.

I really think that Indian doctors were hoping for economic gains and that the logistics of recruiting and moving Indian physicians with their families to Saudi Arabia was more cost-effective than relying on a staff which might be almost entirely American and European. In any case, as far as religious considerations are concerned, Aramco's expatriate employees were either Christian or Muslim.

Hicke: But the Indian doctors were looking for something special with Aramco?

Gelpi: They were looking for a better life and the immediate opportunity of having their families accompany them to a new home.

Aramco's Dhahran Health Center

Hicke: Okay, let's talk a little bit about what changes your life when you got to Dhahran.

Gelpi: I was assigned to a hospital with clinical services a lot similar to what I would expect in a community comparable in size to many small towns in America. The difference was: here we had two populations--the Saudis, and expatriates from America, Europe, the Middle East, and India.

Hicke: They were in separate camps?

Gelpi: To a great extent, depending on a number of factors including nationality, cultural preferences, professional qualifications, and social standards set by the Saudi government. Later, when the Saudis were moving up the corporate ladder into increasingly responsible positions, cultural and other arbitrary barriers which separated Saudis from other employees and their families either disappeared or were at least lowered.

Hicke: Wasn't there a separation of management and employees, rather than simply separation of Saudis and Americans?

Gelpi: In part there was; but there was also definite social separation based on culture, tradition, and religion. To a certain extent this was promoted by the Saudi government, and possibly encouraged by religious authorities. And there may have been some merit to this separation, at least at first. I think that most of us welcomed the idea of mixing freely with our Saudi hosts, but this was not to be--for a while. It was only later, in the sixties and seventies, that there was a social transformation--felt at all levels of the company and in Aramco communities--which brought Saudis and Americans closer together.

Hicke: Possibly at first the Saudis would not welcome an intrusion of another culture?

Gelpi: Then, and possibly even today, the Saudis tenaciously held onto "family values" and cultural standards which had been in place for many generations. In spite of this, they were experiencing an extraordinary cultural challenge because of increasing contact with Westerners involved in oil exploration and oil production. What we were witnessing was a society being propelled rapidly into the 20th century--a change taking place in a matter of years, rather than centuries. And this has had some profound and lasting effects on Saudi society. In the early days, there was a strong fundamentalist element among the Saudi Muslim population, which was--and still is--closely linked to government. This relationship strongly affected government domestic and foreign policy--and still does. To some extent this relationship imposed constraints on an earlier, closer social relationship between Saudis and Americans. But on the whole, I believe that the Saudis responded warmly to their American guests, acted as gracious hosts, and moved at a pretty good clip into a more integrated society.

Hicke: What was your hospital facility like?

Gelpi: As I mentioned earlier, I believe that Dhahran Health Center had about 200 beds. It was modern in every respect, with air conditioning, laboratory and x-ray services, and an up-to-date surgical suite. This was a pleasant surprise, although I had known about this from earlier reconnaissance.

Hicke: How about the staff?

Gelpi: I quickly got to know the staff members with whom I would be most intimately associated in my day-to-day professional work. To begin with these were members of Dhahran's Internal Medicine service.

Hicke: You were in the Internal Medicine service, or you were heading it?

Gelpi: I didn't start as chief of Internal Medicine. A Dr. Les McCoy was the chief when I arrived. And there were two other colleagues-- Dr. Bill Weidman and Dr. Larry Field. Dr. McCoy remained chief for a few months, but was then assigned to the clinic and infirmary in the community of Abqaiq--an hour's auto ride south of Dhahran. In a sense, I was serving as Dr. McCoy's replacement. Early the following year we were joined by a physician from Egypt --the name escapes me--who was recruited specifically to run our tuberculosis inpatient service. At the time we had quite a few Saudis with tuberculosis who were housed in a separate ward, and a larger number who were being managed as outpatients.

Hicke: I read in your notes that this was primarily abdominal tuberculosis.

Gelpi: ~We had primarily pulmonary tuberculosis. But abdominal tuberculosis was surprisingly common--certainly more common than in the United States.

Hicke: I've never even heard of it.

Gelpi: We thought then, and believe now, that the Saudis contracted their tuberculosis through the usual respiratory route but that the disease affected the abdominal organs--mostly small bowel and lymph nodes--more prominently than the lungs. There is also the possibility that they contracted tuberculosis from animal sources. There is a type of tuberculosis which specifically affects cattle but which can be transmitted to humans by milk or milk products. Saudis had access to plenty of camel and goat's milk. But the first cattle were not imported into the Eastern Province of Saudi Arabia until the early sixties; so it is unlikely that the Saudis we saw with abdominal tuberculosis had the bovine type.

The common occurrence of abdominal tuberculosis is by no means restricted to Saudi Arabia; there have been many reports of this disease from a number of developing countries in Africa and the Middle East. There may be something unique about either the transmission of tuberculosis or host response in third-world populations. In any case, regardless of whether one is dealing with human or bovine tuberculosis, it is difficult to tell unless one has rather refined laboratory tests--not always available in the usual bacteriology lab. It may still be only of academic interest, for the treatment available then and now was pretty effective for the treatment of both human and bovine tuberculosis.

Hicke: Could camels carry bovine tuberculosis?

Gelpi: That's an interesting possibility, which we never explored.

Community Clinics

Hicke: Let's go back to when you arrived; there were two other Aramco clinics besides the ones in Dhahran, right?

Gelpi: Yes, Abqaiq and Ras Tanura.

Hicke: Tell me about staffing at these clinics.

Gelpi: Each clinic had a permanent staff, and each of them had its own infirmary for brief hospitalizations. People were placed in the infirmary for observation for relatively mild illnesses not requiring either elaborate diagnostic facilities, major surgery, or intensive medical care. On occasion, we even confined patients with mild heart attacks in these infirmaries. This was before the days of coronary care units, sophisticated cardiac monitoring, and advanced cardiopulmonary resuscitation.

Hicke: For the most part, anyone with a major medical problem who had to be hospitalized would be sent to Dhahran?

Gelpi: Anyone with a serious problem had to be sent to Dhahran. Those with, say, a mild pneumonia requiring only bed rest and antibiotics could remain in one of the district infirmaries.

More About Dhahran Health Center

Hicke: Going back to the hospital in Dhahran, [William L.] Bill Owen, the former general counsel of Aramco, described to me that the first hospital was built in the senior management camp, and then there was another medical facility built in the Arab camp, and there was a tunnel between the two, and then eventually a new hospital was built in the Dhahran camp. What was left of all that when you got there?

Gelpi: Bill Owen was talking about the wooden frame buildings which originally served as hospitals and clinics for Aramco staff and dependents: One was located on the north side of Dhahran, across the highway which separated the northern residential area from the main corporate headquarters and its adjacent residential compound. The other was built on the south side to serve the needs of the larger community of foreign expatriates and their families. The northern facility served the Saudis.

Hicke: The north side was the...?

Gelpi: The Saudi camp. And the south side was the so-called senior staff camp. Both were connected by a tunnel, under the highway mentioned by Bill Owen. And of course medical staff and patients could move back and forth through this tunnel. The frame building on the senior staff side was eventually replaced by a much larger, two-storied structure, which became the Dhahran Health Center (DHC), intended for hospitalization of all staff and their dependents. Ultimately, the remaining frame building on the other side of the highway became a clinic for Saudi dependent women and children.

Hicke: I see. The south wooden building was abandoned with the building of the new hospital. So the new one was for employees?

Gelpi: The clinic facility incorporated into the health center served Saudi males and foreign expatriates with their dependents. The two clinics--A and B--incorporated into the DHC hospital/clinic complex served Saudis and foreign expatriates respectively. The old frame building on the north side became clinic C. I saw patients in all three clinics.

III FACILITIES AND PATIENTS

Contract Facilities

Gelpi: When I arrived in Dhahran, all inpatients, with the exception of those briefly confined in district infirmaries, were hospitalized at DHC. Later on we developed what were called "contract facilities" in Al Khobar--the closest Saudi community to Dhahran. These facilities consisted of small hospitals and clinics managed by independent contractors who were selected by Aramco to manage an overflowing population of Saudis and their dependents requiring primarily inpatient care. A liaison team was established by Aramco to monitor the designated facilities in Al Khobar in order to maintain health care standards comparable to those within the Aramco compounds: Dhahran, Ras Tanura, and Abqaiq. Referrals from these district facilities could often be re-routed to the contract hospitals in Al Khobar, when formerly, all would have been destined for hospitalization in Dhahran.

Hicke: Who ran the contract hospitals?

Gelpi: These were usually managed by physician/entrepreneurs--Egyptian or Lebanese--who set up the facilities with Saudi partners, then extended their services beyond the community in which they were located to Aramco employees and dependents.

Hicke: How about the nearby U.S. Air Force base at the Dhahran airport?

Gelpi: This base was clearly separated both geographically and functionally from Aramco, as was the nearby consulate. I believe that the consular staff and their dependents received care from doctors attached to the U.S. Air Force military mission headquarters at the Dhahran airport. This mission was assigned as an advisory group to the Saudis, and interaction between its medical staff and Aramco's was perhaps more social than

professional. Later on, I got the air force people involved in one of my research projects, however.

Hicke: Did you inspect these contract facilities? How did that work?

Gelpi: Eventually I participated in Aramco's liaison operation, monitoring quality of care at the contract hospitals and clinics. But then I was essentially responsible for evaluating the quality of general medical services--not surgical, OB, or pediatric.

Hicke: What did that involve?

Gelpi: It meant making weekly trips to Al Khobar to evaluate patient care, to discuss patient management--at times, on an individual basis--and to attempt to reconcile standards and objectives of the contract facilities with those of Aramco's health care program.

Hicke: Did they contract with the Saudi government also?

Gelpi: No.

Hicke: It was only with Aramco?

Gelpi: Right. The Saudi government provided overlapping health care services with their own "government" hospitals and clinics.

Hicke: So the contractors came specifically to set up...

Gelpi: Yes, but certainly under the auspices of the Saudi government and with Saudi opposites as partners.

Hicke: You were assigned to the contract facilities?

Gelpi: This was strictly an arrangement between Aramco and the contract facilities. I was merely an Aramco delegate.

Hicke: So you sent them all their patients, either Saudi or American Aramco employees?

Gelpi: Not at all. As I mentioned earlier, they also served the communities in which they were situated. And certainly in the evolution of the contract facilities, people with no Aramco affiliation were encouraged to patronize these facilities. There had been a time when Aramco found itself in the difficult position of providing health care--usually under desperate circumstances--to anyone in need, regardless of his or her affiliation with Aramco.

Serving the needs of the general public, particularly if representatives of this "general public" were even distantly related to the royal family, were influential local merchants or were government functionaries, at times required delicate negotiations between Aramco's Government Relations personnel, prospective patients, and members of Aramco's medical staff. In effect, Aramco's doctors were sometimes being pressured into admitting people with no Aramco affiliation who might just as well have received care in one of the government's own facilities or one of our contract facilities as a non-Aramco patient.

Hicke: Was Jim Knight the head of Government Relations when you were there?

Gelpi: Yes.

Hicke: So you had to work out...

Gelpi: These negotiations often involved a prospective patient who might also have status in the local or central Saudi government--usually someone with an uncomplicated medical or surgical problem. It would involve a representative from Government Relations. And it would involve an Aramco doctor, who was being asked to make a decision about health care on the basis of the patient's preference balanced against the patient's need. In final analysis, the doctor had to decide whether the patient should be admitted to DHC or sent to one of the facilities in Al Khobar.

Hicke: Were there Saudi facilities available?

Gelpi: The only government hospitals and clinics were in the communities of Hofuf and Dammam, which were relatively primitive, when I arrived in Saudi Arabia.

Trips to Qatar in 1960 and 1968

Hicke: Now I'd like to jump ahead to the trip to Qatar.

Gelpi: Within a few months following my arrival in Dhahran, the ruler of Qatar requested medical assistance from Aramco, presumably through the Saudi government, and indirectly through Aramco's Government Relations. Specifically, he requested that an Aramco doctor be sent to Doha, the capital, and then to his large villa nearby. I was sent with an Arab interpreter, who also represented our Government Relations. Upon our arrival we were greeted by the son of a most influential merchant in Eastern Saudi Arabia, Abdullah

Darwish, who spirited us off in his car to the emir's villa. As I remember, this villa looked like a desert fortress right out of a B-grade forties movie about the French Foreign Legion. We actually went through an archway flanked by armed guards in order to get to the inside courtyard. The emir's medical problem turned out to be fairly severe, insulin-dependent diabetes.

His condition was being managed at the time by a British physician, who may have been on loan from the local oil company or permanently attached to the emir and his family. In any case, this doctor was not happy about my arrival, thinking that he had become superfluous. But he managed, with the usual understated British aplomb, to be civil under the circumstances, if not cordial. After interviewing the patient through my interpreter, examining him, and talking with the British doctor, I made a few suggestions, which included this doctor as an essential element in the treatment plan. And everybody seemed to be satisfied. By the time I left, my British colleague and I had established a "first name" relationship.

This was not my last trip to Qatar. I returned in 1968 with an Aramco team to investigate an epidemic of mass poisoning.

Hicke: Let's talk about that trip.

Gelpi: As I recall, it was just another day during the autumn of 1968. Aramco was notified about a sudden, mysterious epidemic in Doha, which had resulted in a number of deaths and a torrent of seriously ill patients flooding the city's clinics and hospitals in a matter of hours. This was on the heels of the Arab-Israeli war of 1967, and there was still a great deal of tension between the Israelis and Arabs. These tensions extended to the countries bordering the Persian Gulf, including Qatar. In Doha, rumors floated about possible Israeli biological warfare or chemical contamination of Doha's water supply. There was no end to speculation by the time the Aramco representation arrived on the scene.

On arrival, we were rushed to the central hospital, where in the waiting areas there were scores of people being triaged for admission--some unconscious, some convulsing, some vomiting, many seriously ill, people at various stages of illness from this mysterious poisoning or infection. Ultimately our team was able to establish that this illness was due to mass poisoning from dieldrin, an insecticide which had been shipped as cargo in a compartment adjacent to a large shipment of flour. Apparently, the dieldrin had somehow been mixed with the flour during shipment or distribution. In any case, the supply of contaminated flour was sent to a specific bakery; and all of those who became ill had

purchased bread or flour to make bread from this bakery on the same morning.

Hicke: They used dieldrin for mosquito abatement?

Gelpi: Yes. But we didn't know what the poison was until much later, after the initial detective work linking the illness to bread, flour, a single bakery, and ultimately to the revelation that the dieldrin and flour had been packed side-by-side in the shipment. There was a point in the investigation when I found myself in the morgue of the central hospital with its administrator and chief of medical staff; I was insisting that we autopsy some of the poison victims in order to analyze stomach contents. By that time it was clear that we were dealing not with some exotic infection--none of the patients were febrile--but with some sort of poisoning. With the help of the World Health Organization and its laboratories, we were ultimately able to establish the nature of the poison. But the first steps included sampling stomach contents of some of the victims who were fatally poisoned.

Hicke: That's how you found out what it was?

Gelpi: Partly. The real detective work was done by team members from Aramco's Preventive Medicine Division. Here we had an epidemic, and my Preventive Medicine colleagues started looking for something in common shared by all the victims. What they had in common was: they had all eaten bread or used flour to bake their own bread, which they ate on the morning of illness or the evening before. The flour had come from one bakery, and its most recent supply of flour had come from one shipment; and so the links of the epidemiological chain came together.

Hicke: So you just treated the symptoms?

Gelpi: Since the illness was self-limited, the survivors recovered with simple supportive treatment.

Hicke: Was the bakery still producing bread when you got there?

Gelpi: I assume that it was. I don't know if it was ever shut down, but it was certainly incriminated as the outlet for contaminated flour and bread. This was not the first nor the last of epidemics of this kind. There have been additional epidemics of poisoning caused by foodstuffs contaminated with dieldrin and other insecticides.

Health Care at DHC and Other Aramco Facilities: Patients

Hicke: Can you tell me something about the patients you were treating?

Gelpi: I was expected to provide personal care primarily for American patients. They were managed very much like they would be in a typical U.S. group practice. Those of us on the Internal Medicine service provided both personal and consultative services for these people. Some patients insisted on an American physician for primary care, and others were referred by other doctors--general practitioners or surgeons. Some were referred from the districts --Ras Tanura or Abqaiq. The referrals were both Saudis and non-Saudi expatriates and their dependents. Most of us internists had a fairly large proportion of Americans as long-term, primary care patients.

As the years went by, I tried to get away from my role as a primary care physician for Americans and more into the role of consultant, teacher, and researcher. In this regard, I was quite happy to spend more time managing Saudi patients and consulting on the more complicated medical problems, both among Americans and Saudis. I was particularly interested in some of the endemic communicable diseases found in Saudi Arabia's Eastern Province. But that's another story.

Hicke: We'll get back to that later. What kinds of problems were you seeing in American patients--anything unusual?

Gelpi: The usual: overweight, high blood pressure, ulcers, coronary disease, the flu. But by and large this was a pretty healthy population. There were the expected, common surgical problems: appendicitis, hernia, gallstones, fractures, and other sorts of trauma. We were dealing primarily with a younger population of adults, not the typical mix of younger and geriatric patients you would expect to find in the U.S.

Hicke: How about depression due to living abroad?

Gelpi: I think that there were probably a lot of psychological problems of which we were only dimly aware. Later, when Aramco expanded its medical services to include psychiatrists and clinical psychologists, these problems emerged simply because they were easier to recognize and easier to treat with the help of skilled professionals.

Community Life

Hicke: Where were you living?

Gelpi: We were living in Dhahran. Our first house was a small duplex. We soon became friends with our next-door neighbors. Within about six months we were offered a larger home, right across the street from one of Aramco's guest facilities--Steinecke Hall.

Hicke: Oh, yes. It must have been named for Max Steinecke.

Gelpi: Yes. We remained there for the balance of our time in Dhahran.

Hicke: Was it comfortable?

Gelpi: I thought so. I thought all of the facilities were satisfactory. Ultimately, we got our own furniture--replacing temporary furniture on loan from the company--consisting mostly of new items purchased during our annual leaves, either in Europe or the U.S.A.

Aramco Medicine

Hicke: Tell me how Aramco's Medical Department evolved.

Gelpi: Its evolution during my stay included Dr. McCoy's transfer to head the Abqaiq facility, as I have mentioned. This was probably about the time that Dr. Page left--either for retirement, for assignment in the New York office, or possibly to take on a position with another organization. I'm not really sure. But upon his departure, Dr. Daggy took over as medical director for all of Aramco's health care services in Saudi Arabia. And shortly after his transfer from head of Preventive Medicine to the position of medical director, a new division of health care was created within Aramco's Medical Department--the Medical Services Unit. This included Internal Medicine, Dhahran's General Practice group, and Pediatrics. In all, this represented about twenty doctors. I was asked to provide administrative and clinical supervision of this unit. I didn't welcome the administrative responsibility, but enjoyed the prospects of clinical supervision with its load of teaching and consultation. Aramco's medical management was trying to consolidate the various fragments of health care into larger administrative pieces, for a variety of reasons.

Hicke: Why did those other departments come under Internal Medicine?

Gelpi: Well, the combination of General Practice, Pediatrics, and Internal Medicine, Surgical, and Laboratory Services was to become the Division of Clinical Services for purposes of administrative convenience. The Medical Services Unit was the largest block of physicians under the clinical and administrative leadership of one person. And it just happened that this one physician was an internist. So I had the largest group of doctors; and it turned out that I was able to do then what many people in group practice and academic medicine today would envy: About 25 percent of my time was devoted to administration, another 25 percent to direct patient care, another 25 percent to consultation and teaching, and finally, another 25 percent to research. This is what many department chairs in medical schools would love to do and can rarely achieve because of overriding administrative responsibilities. My teaching role evolved slowly, but gradually became of increasing importance.

Hicke: Whom were you teaching?

Gelpi: I decided that the DHC was too isolated from the districts--Ras Tanura and Abqaiq. Therefore, I planned weekly visits, alternating with each district, to see problem patients and to build noon medical conferences around case presentations. One of the district doctors would present a case to the assembled group; I would play the guessing game about the diagnosis--typical of teaching hospital conferences in the States--and conclude with an extemporaneous review of what was then known about the disease in question. The idea was to keep the doctors up to date on changing concepts of medicine.

I also started a medical journal club, primarily for those interested in internal medicine, but certainly open to those of our doctors in general practice. Anyone wanting to attend could come. This was an after-hours affair, usually at one of our internist's homes in Dhahran, after dinner, sometimes accompanied by refreshments. We would review journals from our library, going over various topics discussed in these journals, in an effort to educate the assembled group about new concepts and discoveries. Early on, we structured these meetings around a single topic, rather than reporting on multiple topics from several journals. As an example, the topic for a forthcoming meeting might be coronary artery disease, and one of our doctors would review all the available material on this subject over a period of several years from the journals available in the DHC medical library and from those to which he might have a personal subscription. To the best of my knowledge, the journal club is still going.

Hicke: Oh that's good. It seems like a very useful idea.

Gelpi: After the '67 Arab-Israeli war, the district visits were interrupted for a while, possibly because of local tensions among our medical staff generated by the war and its aftermath. But for eight years of my stay in Dhahran, every week--without fail--I would be on the road for a round trip between Dhahran and one or the other district medical centers. Some of the problem patients whom I saw on these visits were hospitalized in the infirmary attached to the clinic, and it was often from these patients that one was selected for the case presentation. This allowed us the opportunity of going to the bedside, examining a patient briefly, and then returning to the conference room to discuss physical findings and the progress of the patient while confined in the infirmary. Later in the day, I would see referrals on an outpatient basis in the clinic, leaving before the dinner hour to return to Dhahran.

I believe that this was a rather successful activity: It promoted a more collegial relationship between the doctors in the district and those at DHC, it eliminated some of the costly and time-consuming trips for patients between the districts and Dhahran for consultations with the internists at DHC, and it fulfilled a teaching function for which it was intended. And of course, I enjoyed the experience.

Hicke: How many hours a day did you work?

Gelpi: This is difficult to answer. We had an on-call system, so that one of us was on twenty-four-hour call every third day. Later on this would include the physician assigned to the tuberculosis service. So a typical day might begin at seven in the morning and last until five or six in the evening, depending on the burden of inpatients assigned to each of us, and how many clinic patients were to be seen. I had my extra administrative chores, impromptu visits to my office by colleagues, a stack of electrocardiograms to be read from DHC and the districts each morning, an occasional urgent visit to our emergency room to see a patient for possible admission, the responsibility of seeing maybe one or two patients after-hours--sometimes in the middle of the night--during my on-call rotation, and finally, Wednesday afternoon grand rounds.

Every week, about three p.m. on Wednesdays, we internists would assemble with those general practitioners assigned to the wards and from our general clinics who could be spared for the occasion; and as a group, we would visit all of the interesting or complicated patients on the medical service. The doctor managing each case would make a succinct case presentation at the bedside, and one or more of our internists would make some suggestions for management or further diagnostic testing. I believe that these

rounds served the patients well and provided an important learning experience for the doctors.

Finally, in answer to your question, I believe that I was working fifty- or sixty-hour weeks, despite which I managed to have lunch at home almost every day, and seldom had my dinners interrupted by emergencies. My living just a few blocks from DHC made response for emergencies quick and easy. On free weekends, my family and I were often at the beach, the community pool, or at the tennis courts. In many ways I was closer to my family and to community activities than my colleagues in the States.

Hicke: Let's review this: There were departments for surgical, preventive, and medical services.

Gelpi: The Medical Services Unit included Pediatrics, Internal Medicine, and General Practice. The Surgical Services Unit included Surgery, Anesthesia, and possibly Diagnostic x-ray. The laboratory services were included in a separate unit; we got our first pathologist soon after I arrived. There was Preventive Medicine as a separate entity, a division. And of course, there was the Nursing Service as an independent group. Here it may be important to point out that we are talking about subdivisions of the Medical Department, not about separate departments of surgery, medicine, and so on. The arbitrary names--divisions, and units--had administrative significance, which was not always clear.

Hicke: When did you take over as chief of the Medical Services?

Gelpi: Either late 1959 or early 1960.

Hicke: Whom did you report to?

Gelpi: I reported to Dr. Daggy, our medical director.

Hicke: Whom would he be reporting to?

Gelpi: He would report to one of a rotating group of junior vice-presidents assigned from a large pool of management people in Aramco's Department of Industrial Relations (IR). This department was responsible for most of the corporate activities not directly related to oil exploration and oil production; and it might seem that as a natural consequence, the Medical Department would be administratively tied to IR. In theory, this seemed to make sense--particularly to engineers and businessmen--but in practice it did not work well. It didn't work well because representatives assigned to the Medical Department from IR had their eyes on a bigger prize, which was top-of-the-company management. It didn't work well because their individual rotations in the Medical

Department's "proving ground" were too brief for the medical director to get to know them, and for them to get to know the details and changing requirements of our organization. In any case, these IR guys were involved on a day-to-day basis with the medical director in making policy decisions which affected the health and welfare of so many people, including Saudis and foreign expatriates, people living in adjacent, non-Aramco communities--the whole Eastern Province of Saudi Arabia.

Hicke: Do you recall any of the names of people in Industrial Relations?

Gelpi: The one I remember the best was a Mr. Deveney or Deveny. He and his family became our personal friends. As my first close contact with Industrial Relations people, I believe that he was the best of a long line of IR representatives who worked with Medical Department management. Unfortunately, he was killed in a commercial airline crash along with other Aramco people, either in late 1960 or early 1961. There were many others, best known to Dr. [Julius] Bill Taylor, who had more direct contact with them than I.

Aramco Provides Medical Services to the Royal Family

Hicke: As we move along, if you think about anecdotes concerning these local celebrities, let's include them. You told me about the trip to Qatar. Were there others?

Gelpi: I believe it was in 1961 that I was summoned to Riyadh to see the minister of agriculture--Khalid Sudairi, I believe. The Sudairi family was closely tied to the Saud family by marriage. This middle-aged man suddenly developed severe gastrointestinal bleeding, thought to be due to esophageal varices (varicose veins in the lower esophagus). The varices develop in the lower esophagus and in the lining of the upper part of the stomach in people who have chronic liver disease. Because of increased back pressure through the portal vein which drains the liver, one or more of these varices may rupture, resulting in catastrophic bleeding. Which is what occurred in this patient, on this occasion. I gather that a member of the royal family close to the King had requested medical assistance through Aramco's Government Relations.

When I arrived at his bedside in Riyadh, this patient was not doing well. His doctors had placed a tube--Sensteken-Blakemore tube--with balloons at one end, which could be inflated both in the stomach and esophagus to control bleeding. But it was in the

wrong place. Both balloons were in the stomach; and they were not controlling the bleeding but were distending his stomach. This was the right equipment being used in the wrong way. By deflating the balloons, withdrawing the tube to the proper location, reinflating the balloons, and exerting traction on the upper end of the tube, the bleeding was stopped. We were able to obtain on-the-spot blood donations, and we had brought supplies for cross-matching blood and transfusions with us from Dhahran. Thus we were able to transfuse the patient in his bedroom--which happened to be in a guest villa, because he refused to be moved to a nearby hospital. Our patient made an uneventful recovery, later went to Boston for surgery to correct his portal hypertension in order to prevent further bleeding, and went on to live out a normal life span.

Before I returned to Dhahran, I was asked by a representative from the King to attend other members of the royal family. I believe I was asked to see one or more of his wives, and as I recall, their problems were medically insignificant. I suspect that they were bored and were looking for a little excitement by an unexpected visit from an American physician--for a change.

Hicke: What were your problems in examining them?

Gelpi: These patients insisted on remaining in bed for their examinations, which considering the size of the beds made contact between examiner and examinee awkward. All of this was observed by ladies-in-waiting, who were in attendance.

Hicke: Were these English-speaking, or had they an interpreter?

Gelpi: I'm certain that I had an interpreter on location, either from our Government Relations or from the royal family.

Hicke: What was Riyadh like?

Gelpi: In those days the capital was a relatively primitive, small town. Besides the royal palace within the royal compound, there was not much around except for the older, mud-brick structures so typical of towns and villages in the Middle East. It wasn't until a decade later that Riyadh began to be transformed into what it is today--a modern city, by all standards. Of course it had its old mosques, which presumably are still standing, and a market, which no doubt, has been vastly expanded.

Hicke: Was there a hospital there, or a clinic?

Gelpi: There was a government hospital--primitive, like those in Hofuf and in Dammam (another town in the Eastern Province, near

Dhahran). I believe that there was also a private hospital, primarily reserved--with its staff--for members of the royal family. But it was not unusual for those who could afford it to seek medical care abroad.

Hicke: I know that during the early years Aramco people were sent to Bahrain for treatment. Were they still doing that?

Gelpi: Not when I arrived. Bahrain has government medical facilities--at the time, they were somewhat more sophisticated than government facilities in Saudi Arabia--and also had then a small clinic and hospital operated by the Bahrain Petroleum Company. It is only fifteen minutes away from Dhahran by airplane.

The Persian Gulf Medical Society and Aramco's Medical Department

Gelpi: Not too long after I arrived in Dhahran, I became involved with an organization then known as the Persian Gulf Medical Society--later, for various reasons, to be called the Arabian Gulf Medical Society. Its membership consisted of a heterogeneous group of physicians, mostly representing the medical staffs of various oil companies and missionary medical centers scattered along the coast. So we had members from Saudi Arabia, the emirates on the Gulf's southern coast, Qatar, Kuwait, Bahrain, and Iran. Strangely, Iraq was not represented; perhaps because of its newly installed totalitarian government with its aversion to things Western.

Hicke: What was the purpose of the society?

Gelpi: To bring various physicians working under similar conditions together in a common cause: What experiences could we share in respect to the medical problems we were seeing? What were the effects of environment and culture on these medical problems? I believe that the underlying purpose of this society was very worthwhile, and I believe that my participation in the society added a lot to my enjoyment of life in Saudi Arabia.

Hicke: This was for an exchange of information?

Gelpi: - An exchange of information; and it later turned out to be a forum for developing research projects related to patient care and the diseases encountered in the Persian Gulf area. This forum was not remarkable in terms of scope and financial support. But doctors were beginning to look at local medical problems with an inquisitive eye, to start recording medical data, and to organize

this data for presentation at the annual meetings of the society. So their observations were reported formally at our meetings, and these presentations provoked discussions among the membership and its guests.

Within perhaps one or two years after my arrival in Dhahran, I was elected president of the Persian Gulf Medical Society. It was just about the same time that we had the society meeting in Dhahran. I was chairman for this meeting, and Lucille and I were totally involved in all of the social arrangements. The meeting was a great success, not only because of the quality of the presentations and the social events which followed them, but also because of the presence of a couple of guest speakers from the faculty of the American University of Beirut's medical school. At the time, one of the guests--Dr. John Wilson--was chairman of the department of surgery at the university. He later went on to become the dean of Stanford's medical school; and we have been close friends ever since.

Hicke: Let's continue with more about this medical society.

Gelpi: From then on, we had annual meetings in various places--Bahrain, Kuwait, and Abadan, Iran. Perhaps the real moving force behind these meetings, at least while I was with Aramco, was the Persian representation from the National Iranian Oil Company (NIOC).

Hicke: Who represented NIOC?

Gelpi: A Dr. Massoud Rouhani. Eventually, the Iranians began to think of this as their own society, even though I was president of this society. There are even those--and I think that they would be Saudis, Kuwaitis, Bahrainis, and others--who would suggest that the society had become an instrument of NIOC and Iran. Of course this wasn't all bad, as far as I was concerned, because the NIOC and its doctors were generous hosts, when the meetings were held on Iranian soil. But inevitably, there was a problem.

The problem centered around the name of the society, not so much its Iranian membership. The Gulf Arabs insisted that the Persian Gulf was misnamed, that it should be called the Arabian Gulf--this, despite the fact that in almost any world atlas it is called the Persian Gulf. The sides were drawn, and I was inadvertently on the wrong side: as president of the society and an Aramco employee I tacitly represented the Arabs--or so the Iranians believed. And it was about this time that I was to turn over the presidency to Dr. Rouhani. Soon I found myself in the midst of an international controversy--words had been exchanged between the governments of Saudi Arabia and Iran about all this. The Saudis insisted the name of the society be changed; the

Iranians wanted the name to remain. I wanted to compromise, and what I had in mind was two medical societies--the Persian Gulf and maybe the Arabian Medical Society. They could have joint meetings.

So it was that on the veranda, overlooking the marina, next to the St. George Hotel in Beirut, NIOC's Dr. Rouhani and I met to work out the compromise. By that time our friendship had become somewhat frayed, and I believe that both of us were looking for an easy way out. What we decided was to have the two societies--one, the Gulf Medical Society, the other, still the Persian Gulf Medical Society.

Hicke: And did that work out?

Gelpi: It relieved tensions. And when I left Saudi Arabia they had started to have meetings of the (Arabian) Gulf Medical Society. Whether or not they included an Iranian representative, I don't know.

IV HEALTH AND DISEASE IN SAUDI ARABIA

[Interview 2: January 3, 1996]

Smallpox

Hicke: Let's start this afternoon with smallpox. Can you tell me something about the problems there, and what you were doing to solve them?

Gelpi: When I arrived in Dhahran, I was aware that smallpox was endemic in the Eastern Province. I was told that the governor of the Eastern Province had launched a vaccination program to include all of the Saudi residents under his jurisdiction--which would also include Aramco's Saudi workforce. How successful the vaccination campaign would be was uncertain at the time; but within a few years it was clear that smallpox had been eradicated in the Eastern Province.

Hicke: Was there resistance among the Saudis to vaccinations?

Gelpi: Since this was essentially a government program, Aramco was only secondarily involved, and, to answer your question, I'm not aware that its Saudi employees were resistant to vaccination. But Aramco was also involved to the extent that some of its employees and their dependents contracted the disease and were hospitalized in Aramco facilities. I can recall that during my first year with Aramco there were always two or three cases of smallpox confined in isolation beds on our medical service at DHC. I have excellent color slides of a number of these patients dating back to that period. Within a couple of years smallpox had vanished from our medical facilities, and, I presume, from nearby communities in the Eastern Province. What the situation was in the rest of the Kingdom is uncertain, because there were no reliable epidemiology reports from any source reflecting patterns of communicable disease in Saudi Arabia at the time.

Hicke: I read that they were doing surveys of the villages. Was that in regard to smallpox?

Gelpi: No. The major surveys conducted by Aramco were related to malaria control and the epidemiology of trachoma. Aramco was not looking for smallpox in the Saudi villages. We saw smallpox when its victims came to the hospital, and these were mostly Saudi employees and their dependents.

Malaria

Hicke: Now, malaria is quite a long story; and I know you want to talk about Richard Daggy's part in that.

Gelpi: Yes, why don't we talk about malaria. Perhaps the first major disease that appeared with any frequency among the Saudis employed by Aramco was malaria. This was apparent from the number of Saudis hospitalized for this disease, and it prompted an investigation of malaria, initiated by our Division of Preventive Medicine. The prime mover here was Dr. Daggy, as head of Preventive Medicine.

Hicke: What time period are we talking about here?

Gelpi: This would be the mid to late fifties. Daggy initiated annual village surveys, which included most but not all of the villages of the Qatif oasis north of Dhahran and the Al Hasa oasis, which is about forty or fifty miles south of Abqaiq. These annual surveys were carried out continuously during my employment with Aramco.

A team from Preventive Medicine would go to each village and take blood samples from a cross-section of its residents, which included a high proportion of infants and children. The team would survey about a dozen villages on an annual basis, and on the basis of microscopic examination of each blood sample, determine the types of malarial organisms infecting the population, perhaps the duration and intensity of infection--based on feeling enlarged spleens in people examined--and also the proportion of people infected.

There are four species of malaria which infect humans, three of which were carried by mosquitoes in the Eastern Province. The organism causing the most dangerous form of the disease, Plasmodium falciparum, was present in the Eastern Province and accounted for a high proportion of infections. Any one of the

four types may cause severe illness, but falciparum is clearly the most dangerous because of the intensity of infection--that is, the large number of organisms often present in human infections.

Hicke: Well, I'm going to ask you some questions, the answers to which may seem obvious to you but might not to me or some reader. Malaria comes from mosquitoes; so I suppose the malaria developed in the oasis areas primarily. Well, would the oases be the normal areas of civilization anyway?

Gelpi: The oases were heavily populated, and had been, as far as we know, for millenia. And the reason for this is that there were natural water sources which encouraged the development of agriculture. Typical oasis agriculture centered around cultivation of the date palm, but the soil and irrigation systems in these oases supported cultivation of a variety of vegetables.

The water sources, while not necessarily stagnant, supported the development of mosquitoes; and of course mosquito control became a central element in malaria control. Mosquito abatement was accomplished by means of a three-pronged attack: residual spraying with insecticides, starting with DDT; spraying oil on stagnant bodies of water to discourage the development of mosquito larvae; and the introduction of larva-eating (larvacidal) fish, minnow-like gambusia. There were some attempts at hydraulic engineering to control flooding, irrigation sources, and to divert irrigation away from densely populated areas.

Our main malaria carrier (vector) was, and is, a bug called Anopheles stephensi. Fortunately this mosquito has a short flight range, so that communities outside of the oases were less likely to be affected by malaria. The control measures introduced by Aramco were quite effective in largely eliminating A. stephensi from the oases and surrounding areas.

Hicke: This sounds like it's part of a whole land-use issue--different patterns of irrigation.

Gelpi: Maybe the key control measure was residual spraying. The oil spraying and the use of larvicidal fish were perhaps of secondary importance. Residential residual spraying was probably crucial.

Hicke: Was the spraying done by the government, the Saudi government?

Gelpi: It was a cooperative enterprise, which at least at first involved Aramco. But Aramco was always intimately involved as an interested bystander, because a large proportion of its workforce came from the oases and town sites nearby. Later, there were increasing numbers of employees from other parts of the Kingdom;

but initially, Aramco depended for much of its manpower on the local Saudi population.

Hicke: Would the spraying programs have been developed by Aramco?

Gelpi: Yes, in consultation with an entomologist who was part of Aramco's Preventive Medicine team.

Hicke: Do you have any idea about who started the residual spraying and when?

Gelpi: I can't give the details. Either Dr. Richard Handschin or Dr. Daggy would be the most reliable sources for this information. And we do have some published material which may deal with this issue.

Hicke: Is there anything more you can tell me about Dr. Daggy's work?

Gelpi: In 1959 he published a rather large monograph on malaria in the Eastern Province, which was included as a supplement to its monthly journal by the American Society of Tropical Medicine and Hygiene.¹ I'll be including this in a bibliography to accompany these oral histories. In effect, this publication describes the conditions prevailing in the oases which led to endemic malaria, the effects of malaria on the local populations, the control measures applied, and the results of control measures in terms of the declining frequency of infection among oasis inhabitants. The publication says something about coordinated efforts between Aramco and the Saudi government to develop malaria control and eradication in the Eastern Province. And it describes the results of control measures against the backdrop of annual village surveys.

Aramco's Health Care Program and the Saudi Government

Hicke: What was Aramco's relationship with the Ministry of Health?

Gelpi: There was a longstanding relationship on the basis of referrals from government medical facilities--usually for urgent medical care--in areas where Aramco's hospital and clinics were close enough to make such referrals practical. Aramco had an open

¹Richard H. Daggy, "Malaria in Oases of Eastern Saudi Arabia," American Journal of Tropical Medicine and Hygiene, Vol. 8, No. 2, Part 2 (March 1959), 223-291.

policy which permitted its doctors to make discretionary decisions about need, and, as you might expect, about how interesting or educational such referrals might be as patients in our hospital. In a sense, government and Aramco health care practices frequently converged, based on proximity, subtle pressures through our Government Relations staff, and the type of illness being considered.

Hicke: Was this a formalized policy, do you know?

Gelpi: As I have implied, I don't believe it was ever formalized; rather, it was a tacit understanding which gradually evolved between local government functionaries and Aramco--an arrangement modified from time to time, depending upon local needs, changes in Aramco management, and upon the potential overuse of Aramco medical facilities by non-Aramco patients. When our hospital was full, this led to our discouraging hospitalization at DHC of people with no Aramco affiliations, particularly at a time when we began to encourage admissions to our contract facilities in Al Khobar.

Hicke: This must have created reporting and record-keeping difficulties. How did this work?

Gelpi: I'm certain there were difficulties in keeping medical records. It was easy enough, in each designated contract facility to keep records of admissions, discharges, and diagnoses. And at any one time we had a rough idea of the sorts of medical problems which were being managed, and an even better idea about actual numbers of people coming from and returning to Aramco medical facilities. I don't believe that this was duplicated in government clinics or hospitals; and if it was, we really had no access to such records. Often, patients would be transferred to DHC from a government facility with virtually no information except personal identification, a sentence about the nature of the illness, and a statement that the government doctors couldn't handle the problem.

Hicke: Yes, that's what I was thinking about. And there's the problem of whom to call if the patient has a further problem or complaint.

Gelpi: If the patient was referred to Aramco, he was usually sent to us indirectly through our Government Relations. This triage system acted to screen out people who were far removed from any connection with Aramco, who had a minor medical or surgical problem, and who were not intimidating in terms of their high connections. And Government Relations people had to use great discretion when caught between reluctant medical staff and persuasive patient advocates. Sometimes the pressures were extreme, as in the case of a very influential person in government. And the intensity of these pressures, opposing the

diplomacy of Government Relations, determined the ebb and flow of non-Aramco patients into our health care system.

More about Aramco and Malaria Control

Hicke: What was the status of malaria in the Eastern Province when you left?

Gelpi: In the period of eight years, while employed by Aramco, I saw a progressive decrease in the incidence of malaria. And I don't think there is any question that this was directly attributable to Aramco's program of control and year-by-year monitoring initiated by Dr. Daggy, which was eventually picked up by the ministry of health. That is to say, Aramco's Preventive Medicine people provided essential information about the intensity and distribution of malaria in the oases. The government ultimately provided incentives and means for malaria control. I think I may have arrived at a time when malaria had reached its second apogee (the first was actually in the forties). And I left Aramco at a time when there were relatively few cases. So we're talking about a span of maybe a decade in which there were profound changes in the endemicity of malaria.

Hicke: Were Americans getting something to combat malaria? I don't know when it was developed, but I know now you take pills if you go into an area where there is danger of infection.

Gelpi: Americans lived relatively close to the malarious area. But as far as I know, with the possible exception of some daring campers or passing travelers, foreign expatriates simply didn't get malaria living in Dhahran or the districts. This was mainly because the mosquito vector has such a short flight radius. In summary, foreigners, including Americans, did not have to take prophylactic medication because they were protected by distance.

Hicke: Is there anything else about malaria that you'd like to mention?

Gelpi: I got interested in the malaria surveys because the village survey seemed like a good vehicle for doing other kinds of research. In other words, if you were using blood sampling in the surveys, you could be testing the samples for other things besides malaria. And that's where I came into the picture later on--sampling for the sickle cell trait, and for a genetic marker called red cell G6PD, which we'll get into. So I went piggyback on the annual malaria surveys for a couple of years. It was a wonderful way to collect hundreds of blood specimens, and to process them in my

laboratory with the kinds of tests that were available to me. In a way, this testing was relevant to malaria, because the disease is closely associated with both the sickle cell trait and G6PD deficiency. More about this later.

Hicke: So actually, the village surveys established a certain precedence.

Gelpi: Yes. I think they probably introduced the villagers to the idea that strange people entering the village for what seemed to be no particular therapeutic role were nevertheless providing services, indirectly; and actually, once they got the idea that somehow this might lead to improvements in their lives--to less disease--they seemed to be quite willing to cooperate.

Hicke: They didn't mind being "stabbed"?

Gelpi: No, this was done with such skill that it was relatively painless. Most of the subjects were infants and children, and the sampling did not involve puncturing a vein for blood, but just a finger stick or an earlobe stick with a sharp lancet to obtain a few drops of blood. There really wasn't any trouble getting the villager to cooperate.

Trachoma and Aramco's Trachoma Research Project

Hicke: Next on my list is trachoma, and I know that was a big project.

Gelpi: Ideally, the people that could best discuss trachoma are those who were the active participants in the research project. Of all those involved, Dr. Jack Snyder, representing the Harvard School of Public Health, was the prime mover, and he would be the right person to talk to. But as a physician...

Hicke: And we don't know if we're going to get to talk to him. Whom would he have worked with at Aramco?

Gelpi: Dr. Roger Nichols, who represented the Harvard program in the field, with headquarters in Dhahran. Another was Dottie McComb, a full-time technologist sent to Dhahran on a more or less indefinite basis to work in the laboratory and in the field with Dr. Nichols on village surveys. These surveys were not done in conjunction with the malaria project, but independently, to work out the distribution of trachoma: which villages were involved, how many people were affected, and so on. The Harvard/Aramco trachoma project lasted almost twenty years, from the mid-fifties until the mid-seventies.

Hicke: I have it as beginning in 1954. Do you know how it got started?

Gelpi: When I arrived in Dhahran I was not aware of the origins of the trachoma project; nevertheless, it was in full swing. The laboratory was on the second floor of Dhahran Health Center, and the people engaged in the project were involved in a vigorous program of village surveys to isolate the organism which causes trachoma, to grow the organism in eggs, and to refine a new technique for staining the organisms in eye scrapings. This technique consisted of tagging antibodies against the trachoma organism with a fluorescent dye, then putting the antibodies on eye scrapings to combine with the trachoma organism so that the trachoma would shine as brilliantly fluorescent particles under the microscope. This is a very powerful tool, and more specific than the usual methods for staining cells and tissues for viewing under the microscope. And of course this makes it useful in doing surveys on large numbers of people who are suspected of being infected with the trachoma organism.

Hicke: It sounds like there must have been a sophisticated lab.

Gelpi: It was. And the people who were operating the laboratory were using techniques which they had imported from the United States for doing epidemiological studies to track down eye infections, and for being able to decide whether these infections were due to the trachoma organism or some other cause.

Hicke: Was Dr. Snyder actually on site?

Gelpi: He may have made site visits, but basically he was at the Harvard end of the operation. There were comings and goings of people from the Harvard School of Public Health who were interested in various aspects of trachoma and in other eye infections. There was a need to review progress, to keep the operation funded, to establish and develop research priorities, to enter the results into peer-reviewed publications for various journals, to interact with Aramco management on behalf of the trachoma program, and to interact with personnel in Aramco's Medical Department.

Hicke: But they weren't doing any of the actual lab work?

Gelpi: They may have, but it would have been correlative--checking results--and at least some of this would have been done back at Harvard.

Hicke: This went on for how long, do you know?

Gelpi: From 1954 probably to 1973 or 1974. I'm not exactly sure when the trachoma project was officially terminated.

Hicke: Did it have anything to do with your work at all?

Gelpi: I had little to do with the trachoma project. The existence of trachoma and malaria research sponsored by Aramco persuaded me that other types of medical research might be welcomed. It seemed to me that there were other problems waiting for research projects, and that encouraged me to start looking.

Q Fever in Saudi Arabia

Gelpi: I'm trying to think of the first possible investigation that interested me. I guess that the place to start would be mentioning a disease which really hadn't been either diagnosed or defined before my arrival. It had probably existed for quite a while. Every year there would be a minor epidemic of an influenza-like illness among Americans and other foreign expatriates living in Aramco residential facilities. This was passed off as a type of flu that you might see in the U.S. The Aramco epidemic would occur about the same time each spring.

I happened to have a couple of the victims--sick enough to be admitted to our hospital--as patients. Each had a pneumonia; and besides x-ray evidence of the pneumonia, they had abnormal liver function tests. This would be quite unusual for otherwise uncomplicated viral pneumonia, which sometimes occurs with the flu, or influenza. And this got me to thinking about similar illnesses I had encountered in the United States, when I was working at the VA hospital in Fresno. In that case I remember some patients with pneumonia and abnormal liver function tests who turned out to have Q fever. I won't go into a lot of detail, except to say that Q fever is a disease caused by a microorganism called Coxiella burnetii, bigger than a virus, smaller than bacteria. It basically causes infections in domestic animals--sheep, goats, and cattle--which may secondarily be transmitted to humans, causing an inapparent infection, but sometimes causing disease which may be very severe.

It turned out that my two Aramco patients had Q fever. We didn't make the diagnosis by isolating the organism--which is a risky thing to try in the laboratory--but by finding specific antibody against Coxiella in blood samples from our patients. The precision of this test lies in comparing the level of antibody early infection with that during recovery. If the antibody level jumps up, this is attributed to Q fever infection. So presto, you have a diagnosis!

It seems that this disease was endemic in Saudi Arabia. To make a long story short, I was able to demonstrate infection in goats and sheep. And I was able to show that a new dairy herd (cattle), which had been sent to Hofuf from Denmark, was free of infection shortly after arrival. The same herd was found to be infected when retested a year later.

Hicke: How did humans become infected?

Gelpi: Certainly Americans and other expatriates with Q fever were not getting it from close contact with Saudi livestock. But during parturition--the birth of lambs, kids, and calves--great amounts of infectious material are released into the environment, and under conditions of periodic high winds, which occur starting in the spring and continuing into the autumn, organisms are presumably dispersed great distances. And of course the birth of these animals typically occurs in the spring months in Saudi Arabia.

There were reports that Americans working for Aramco and for the American consulate in Riyadh were experiencing the same "flu." But, rather than look for antibodies against Coxiella in blood samples from this group, I used a test in which non-infectious material from this organism is injected under the skin. And it was possible to show that quite a few had Q fever infection. The skin test is similar to that used to detect tuberculosis. The survey was conducted by Dr. Ivan Alio, epidemiologist for our Preventive Medicine Division.

I was also able to show that high proportion of Saudis had had previous infection, most likely inapparent; that one could expect positive skin tests in Americans who had lived in Saudi Arabia for more than brief periods; and that the longer one had resided in Aramco residential areas, the more likely one was to have become infected.

Finally, I was able to investigate a population of airmen attached to the U.S. military mission at the Dhahran airport with the help of medical officers who were part of the mission. These people were assigned for two years of duty in Saudi Arabia; so it was possible to test new arrivals, and compare them to those who had been around for a while. And of course those who had been assigned the longest were more likely to show positive skin tests. They may not have remembered being ill; but indeed, they had been infected. So it became obvious that seasonal Q fever was pretty widespread in Saudi Arabia's Eastern Province.

Hicke: Can you elaborate a bit on how you actually organized the research, such as filling out forms, requesting permission...

Gelpi: I had to ask permission from every person upon whom we took a blood sample or did a skin test, which required that I explain the purpose of testing. In the case where I extended the testing to animals--obtaining samples of blood and/or milk, looking for tell-tale antibodies--I had to explain what was going on to the owners. I remember on one occasion in the desert asking a Bedouin herdsman for permission to test his goats and sheep. He was amused, but quite ready to let me do the tests on his animals, and then invited me into his tent for tea and an introduction to his family.

Hicke: How about camels?

Gelpi: That is an interesting question. I was not able to test camels for a variety of reasons. But I did just about everything else, still suspecting that camels were involved. I found a way to test milk samples for antibodies, and I was able to use this on cow's milk. Taking blood samples from cows is not easy; but I obtained blood and milk samples from cows and goats and found that they have antibodies in the milk.

Hicke: Were you doing this testing yourself?

Gelpi: I did the sampling, testing--except those skin tests that I mentioned--and all the laboratory work by myself. But I sent some serums away for special testing at laboratories in the United States, and a few to our serology lab, operated by Preventive Medicine, at Dhahran Health Center for tests on clinic and hospital patients suspected of having Q fever.

Hicke: What kind of support did you get from Government Relations?

Gelpi: I told Government Relations what I was doing, insofar as it affected people not directly connected with Aramco; and I certainly cleared the work with our medical director. Beyond that, I carried out the negotiations and other arrangements myself. In fact, I went to the dairy owner in Hofuf in order to sample his cattle, telling him exactly what I was doing and getting his permission. It actually seemed that I was welcomed. I was questioned, which was appropriate, but I was never turned down.

Hicke: Did you take an interpreter?

Gelpi: Oh yes, I took along an interpreter. My Saudi hosts were generous, interested, and helpful, and I really didn't have any obstacles. My only obstacle was limits on my time and personal effort I was able to put into this type of research.

Hicke: Did you develop any preventive procedures?

Gelpi: The whole idea, of course, was to provide effective treatment and prevention. But the idea of controlling itinerant herders and their animals didn't turn out to be very practical. What was practical, however, was to recognize that some of the illness passed off as the flu could be successfully treated with certain antibiotics specific for Coxiella infections. Having a high index of suspicion in patients with the combination of pneumonia and abnormal liver function tests that an illness was Q fever would be enough for the attending physician to start treating with the appropriate antibiotic to shorten its duration.

Hicke: Would the patient have to be hospitalized?

Gelpi: Probably the vast majority of people who got this infection were no sicker than those who might have stayed home with a fever for a couple of days, thinking that they had the familiar flu. They wouldn't go to the hospital. Some would be quite ill. This disease can be potentially deadly in those individuals with a heart valve defect. The Q fever bug can attach to the damaged heart valve and cause severe complications, which can be fatal.

Hicke: Was Q fever still occurring when you left?

Gelpi: I have the sinking feeling that once I had stopped research on Q fever nobody else picked it up. As far as I've been able to tell, since I left in 1968, I have seen no other publications on Q fever in Saudi Arabia after my own. Q fever has been recognized in other Middle East countries, notably Israel and Iran, but I have seen nothing about the infection in Saudi Arabia. Among the people with whom I was working in Aramco, and also among the Saudis--although engaged in all sorts of other medical research--there has been no evidence of recognition or interest.

Hicke: You went back there in the seventies, and you did not hear anything about it?

Gelpi: No, but I have no reason to believe that there isn't just as much Q fever now as there was then. As long as there are herds of sheep and goats wandering around in the desert, and as long as these herds are near settled areas, such as the Aramco communities and other towns in the Eastern Province, there is every reason to believe that people are still getting infected.

Hicke: There's nothing that will prevent the animals from...

Gelpi: From acquiring and transmitting infection? I'm not sure, but for veterinary purposes, there may be a vaccine for this. But there

is no vaccine for humans, as far as I know. During the Desert Shield/Desert Storm engagement, this issue was brought to the attention of our military people, who were concerned about the possibility of the Iraqi use of biological warfare agents against our forces. I don't think that Coxiella would be an effective agent, even though small doses cause infection. However, I don't think the enemy was seriously considering it, for there are much more dangerous and effective agents for use in biological warfare.

Pulmonary Ascariasis

Hicke: What else were you working on?

Gelpi: Another pervasive, even more interesting medical problem was what we call pulmonary ascariasis. There is a parasitic worm, Ascaris lumbricoides, which together with the pinworm accounts for most of the human worm infections in the world, particularly in third world countries. In Saudi Arabia, every year during the spring months, we would see quite a few cases of pneumonia among Saudis. The strange thing about this type of pneumonia was that it seemed to change day by day, depending upon how often one takes x-rays, which is unusual. Secondly, it was associated with a marked increase in a certain type of blood cell called the eosinophil. These two findings, that is, a changing x-ray picture of the lungs together with an increase in the number of eosinophils in the blood, made a distinct syndrome.

Hicke: So this is a kind of pneumonia?

Gelpi: Yes. Mild fever, with the main symptom a severe cough. The patients didn't seem very ill, but they all had a severe, constant, uncontrollable, dry cough. Some coughed so much that they were exhausted from lack of sleep, and perhaps this symptom alone led to a hospital visit. Getting an x-ray with a rather alarming, extensive pneumonia would lead the admitting physician to think that the patient was a lot sicker than he or she actually was, and this would prompt admission. Once in the hospital, these patients would be treated with various types of antibiotics, without a clear diagnosis or notion of what was going on.

It occurred to me, in seeing some of these patients as a consultant, that this might be a parasitic worm infection because of the very high levels of eosinophils in the blood of every patient. What type of worm infection could be common out here? This was rather easy to determine, because our Preventive Medicine people and laboratory service had carried out surveys, using stool

samples for microscopic exams. Of course, ascaris infection was a fairly frequent finding.

The next question was: why would ascaris cause pneumonia, and how would it cause pneumonia? Because this is an intestinal parasite. The answer is clear. The infection starts with ingestion of eggs from the adult worm under conditions of poor sanitation. The eggs mature into larvae (minute, motile worms). The larvae penetrate the wall of the intestine and actually migrate through the intestinal veins into the liver, and ultimately the lung. Here they migrate through the small capillaries into the alveoli--the little air sacks--and then up the bronchial tubes to the esophagus, where they are carried into the stomach, finally lodging in the small intestine to reach maturity. The male and female worms copulate, eggs are produced, which pass through the intestine into the stool, and the cycle begins once again.

Hicke: It sounds like that "Journey Through the Bloodstream" movie!

Gelpi: It's really quite an incredible journey. Actually, during the migration of these second stage larvae, as they move through the lungs and bronchial tubes, they create intense inflammation, leading to the severe cough and the characteristic widespread x-ray changes in the lungs. When you look at typical x-rays, you see what is called a "patchy" pneumonia, which in some ways--with just a single x-ray--might be difficult to distinguish from viral and bacterial pneumonias.

By the time the larvae have completed their journey from intestine through the liver and into the lungs, they have stimulated the body to produce protective antibodies. The body becomes aware of the invader and produces antibodies; but nothing much happens until the larvae reach the lungs. And there they are held up. For by this time the antibodies are attracted to the larvae, and these larvae are releasing proteins called antigens--unique to A. lumbricoides--which combine with specific antibody to form complexes which cause the intense inflammatory reaction which results in a pneumonia which skips around in the lung--a migrating pneumonia.

Hicke: Tell me how you found all this out.

Gelpi: The best answer is serendipity. I think it was Louis Pasteur who suggested that every time you have an accidental discovery, if it does not prompt some sort of critical thinking or reasoning, your efforts have been wasted. We were able to identify the typical larvae in the sputum of several patients, which allowed me to prove my point--that the pneumonia was an allergic reaction to the

worms. We were able to markedly relieve the symptoms by injection of what we call adrenocorticosteroid hormones--which don't cure infections, but which powerfully suppress inflammation. An example would be the use of a drug called prednisone, which is used to treat people with severe asthma, who often have increased blood levels of eosinophils, and who resemble our patients with ascaris pneumonia in certain ways. This worked well in treating patients who were quite ill, because the condition is self-limited. Once the larvae get out of the lung and into the intestine, all the symptoms subside.

Hicke: So prednisone reduces the inflammation?

Gelpi: Yes, by reducing the effects of the antigen-antibody reaction which I described. This reaction is somewhat similar to what happens when someone with hay fever gets pollen on their nasal mucus membranes and in their eyes. There are antibodies in the membranes which recognize the pollen proteins, and complex with these antigens to produce a local, intense reaction, which we call allergy. This results in the familiar symptoms of sneezing and itching, inflamed eyes. This is similar to what goes on in the lungs and bronchial tubes of people with ascaris pneumonia.

Hicke: Over what period of time did you work on this?

Gelpi: I worked on it for a couple of years, and then got out a couple of publications on the problem.¹ I had reason to hope that this might prompt people to be more aware of this condition throughout the Kingdom. Subsequently, I have seen no more publications on this disease from Saudi Arabia or elsewhere in the Middle East. But there is also reason to believe that with time, and the great improvement in the level of sanitation and public health, the disease is disappearing on its own, and that special intervention isn't necessary. But I'd also be willing to bet that there are many countries in the world which share the seasonal conditions which prevail in Saudi Arabia and which promote this type of infection.

There are probably many, many people who have a type of pneumonia similar to what was occurring with the Saudis. What made this a seasonal condition in Saudi Arabia is that the ascaris eggs will not survive in high temperature--the temperatures which prevail on the Arabian peninsula from late spring into late autumn. It was only with the winter rains that conditions became optimal for transmission of ascaris infection, so that we would see most of our patients in the months of March through May.

¹See Bibliography.

Hicke: Has this been found in other parts of the world?

Gelpi: It has been described elsewhere. Perhaps the earliest publication on this problem came from Switzerland, of all places. The report indicated that human waste was being used for fertilizer to grow produce, and that some of the farmers were becoming infected with ascaris. But as a seasonal medical problem, the first publications--maybe the last--have been from Saudi Arabia.

Hicke: When did you publish this information?

Gelpi: It was published from the mid to late sixties, and represents another step in our understanding of human parasitic infections and in our understanding that some types of pneumonia are really not what they seem, but that they're due to worm infection.

Hicke: At Dhahran Health Center, they're still aware of your work?

Gelpi: I doubt it. I've learned that published research is soon forgotten, unless there is some reason for resurrecting somebody else's research and applying the results. If researchers don't recognize that earlier work is relevant, they're not going to read a paper that was published twenty years ago, just out of curiosity.

Hicke: I can understand that.

Gelpi: I suspect that the problem of pulmonary ascariasis has gone away. The reason I believe this is because conditions in residential areas where many of our Saudi workforce and their families lived during the fifties and sixties have markedly improved in terms of sanitation. You're not seeing the soil contamination with human waste which was apparent then.

Hicke: That's what produces the worm?

Gelpi: That's what allows the worm eggs to get into the food chain, to recycle the infection. So better plumbing has helped with a lot of things.

Cancer

Hicke: What else were you working on?

Gelpi: One of the problems which interested me out there was cancer in Saudis. We were dealing then with a relatively young population,

in which you wouldn't expect to see certain cancers which were relatively common in the United States--prostate, breast, colon, and lung cancer. We simply weren't seeing much of this in Saudis. The fact that we were seeing mostly young adults and children in our hospital and clinics made comparisons with representative populations in Europe and the United States and Canada unreliable.

Hicke: The Saudi population was younger because the life span was shorter?

Gelpi: Most of our employees and their dependents were young. So we were looking at a special group of people in a special environment. And it turned out, interestingly enough, and not unexpectedly, that the type of cancers we were seeing were different. It was my colleague, Dr. Bill Taylor, who published the first paper on cancer in Saudis, which appeared in the journal Cancer, in the late fifties or early sixties.¹

He was finding the kinds of cancers that you might expect to see in a relatively confined, middle-class, younger population in a Western country--leukemias and lymphomas--rather than in a population with a broader age representation. And I noticed that a number of patients I was seeing in the hospital had what we call abdominal lymphoma. They presented with abdominal pain, or abdominal swelling, or both. And it was usually not clear what we were dealing with until some had exploratory surgery and were found to have lymphoma involving their intestine, the lining of the abdominal cavity, or in the abdominal lymph nodes. This seemed to be quite a bit different than the usual presentation of lymphoma in Western countries in any age group. The organs primarily affected were in the abdomen rather than in the chest, or in the lymph glands (nodes) elsewhere in the body.

I had been used to seeing younger patients in the United States with Hodgkin's disease (a type of lymphoma) and other types of lymphoma, with swollen lymph nodes in the neck or armpit, or maybe enlarged lymph nodes, detected by x-ray, in the mediastinum --that space in the middle of the chest occupied by the heart, trachea, great vessels, and esophagus.

But in Saudi Arabia we were seeing people roughly the same age with lymphoma, seemingly confined to the abdomen--more difficult to diagnose. And the disease was particularly more difficult to diagnose because of confusion with abdominal tuberculosis--also common among Saudis. So here you had two diseases with overlapping manifestations--one could be initially mistaken for

¹Julius W. Taylor, "Cancer in Saudi Arabia," Cancer, Vol. 16, 1963.

the other. The only way you could make the distinction, at times, was by exploratory surgery, with biopsy of diseased tissue.

Hicke: How did all of this affect your making a diagnosis?

Gelpi: With a high index of suspicion, the diagnosis still had to be confirmed either by finding tuberculosis organisms or by finding in diseased tissues the typical cell pattern indicating that the patient had lymphoma. The importance of this distinction, of course, lay in choosing the right treatment. Because people with tuberculosis could be treated effectively with the antimicrobial agents available at the time. With lymphoma, the choice of treatment was much different, and more complex. Many could have been treated with x-ray, but we did not have therapeutic x-ray available in Aramco medical facilities. We had only diagnostic x-ray. So people with lymphoma would have to be referred out of Kingdom. I'm not sure that radiation therapy (x-ray, et cetera) was available either in Riyadh or Jiddah at the time. We could treat them with chemotherapy, but this was by no means always as effective as x-ray.

Hicke: Do you have any idea why they were developing this type of cancer?

Gelpi: We know that a similar high incidence of lymphoma had been reported from other third-world countries in North Africa and the Middle East. In fact, someone coined the term "Middle East lymphoma" to describe this disease. Some of the important work on this problem, with resulting publications, was being carried out elsewhere while I was investigating abdominal lymphoma in Saudi Arabia.

The prevailing notion then was that multiple, recurring, intestinal infections of various types--beginning in infancy--led to a marked stimulation of those tissues responsible for the immune response in the gut and in the lymphatic system associated with the intestinal tract, with of course increased proliferation of immuno-competent cells. Ultimately this growth would get out of control, lose its self-regulating characteristics, and turn into cancer. If you look hard at third-world countries, worldwide, this problem is probably there waiting to be discovered. For it is not likely to be unique to Africa or the Middle East, because lifelong recurrence of intestinal infections is a universal problem in developing countries.

Hicke: What's happened to this research on abdominal lymphoma?

Gelpi: I think that the excitement generated by this and other exotic diseases tends to die out. I also think that what the identification of this disease, abdominal lymphoma, may have done

is to encourage trials of new sorts of treatment. And there is evidence that the prognosis for patients with abdominal lymphoma may be better than that for patients with the types of lymphoma encountered in Western populations. But I don't believe that there have been any major breakthroughs in this area over the last twenty years.

Hicke: Is it a fairly high percentage of people who recover?

Gelpi: I can't tell you exactly; but the combinations of x-ray and chemotherapy may be more effective than one would expect with lymphoma, generally.

Hicke: Once again, were these mainly Saudis who were infected?

Gelpi: All were Saudis. This was not a problem among European or American expatriates. It was strictly a problem endemic to Saudi Arabia. And actually, I don't think we were seeing it among other people from Middle East countries--Lebanon, Jordan, Syria, Egypt--living in Saudi Arabia. But I wouldn't go beyond the presumptions I had at the time the report on this problem from Saudi Arabia reached publication.

Conference in Shiraz, Iran: G6PD Deficiency and Favism

Hicke: Meanwhile, you still had your regular duties?

Gelpi: Well, of course I was taking care of patients and doing a lot of administrative chores. It was a period in my life of intense activity.

Hicke: Yes, I can see that.

Gelpi: Another area of interest: in the early sixties I went to a medical conference in Shiraz, Iran. And at this conference, the pathologist at the university medical center in that city--Nemazee Hospital--presented a paper on red cell glucose-6-phosphate dehydrogenase (G6PD) deficiency in the Iranian population living in the city or nearby. G6PD is an enzyme which protects the red cell membrane from oxidation. A deficiency of this enzyme leads to interaction between red blood cells and a component of fava beans--a major dietary item in the Middle East.

It seems that fava beans have a particular substance which damages the red cell membrane, when the red cell is deficient in G6PD, and results in rupture of the cell membrane. Many red cells

break down in this fashion, releasing their content of hemoglobin. And this may lead to the rapid onset of anemia, release of a large amount of free hemoglobin into the blood and ultimately into the urine. The loss of red cells and the flood of hemoglobin passing into the urine may result in severe anemia, kidney failure, and death. Is it common? Favism, as it is sometimes called, is widespread and well known among Mediterranean populations. But as far as I know, favism and G6PD deficiency had not been previously reported in the Middle East until this particular conference, at which time it was discussed by the pathologist, Dr. James Bowman.

Hicke: Do you have any idea what year this was?

Gelpi: This would have probably been 1960 or 1961. Needless to say, it took me a mere instant to at least consider the possibility that if this condition was prevalent in central Iran, where people ate fava beans, it may also be prevalent in the oases population of eastern Saudi Arabia, where they also eat fava beans.

Hicke: Oh, they do?

Gelpi: The fava bean is a dietary staple. And the question then was, why are we missing this condition?

Hicke: You didn't have it then?

Gelpi: It turned out that we did have it, and that we had been seeing children with favism in our emergency room and on our hospital pediatric service probably for as long as DHC had been open for business. A parent would bring in a very pale, sick child, who would be admitted to the hospital for severe anemia. Nobody was asking the question, what did the child have to eat the day before? I came back from the meeting in Shiraz with a messianic message, which was: Let's start looking at our admissions, particularly on the pediatric ward, to see if we are getting cases of favism. The clue was, and is, the presence of hemoglobin in the urine. Well, we were getting cases of favism, except the diagnosis had been missed.

The next step was to go out and see how common G6PD deficiency was, and where it was. In the oasis population? How might one best survey the oasis population? As a supernumerary with the annual malaria survey team, tag along I did, with my capillary tubes for collecting minute blood samples and my lancets, and I found that eastern Saudi Arabia has one of the highest concentrations of G6PD-deficient people in the world.

Hicke: And nobody knew it before you arrived with your lancets?

Gelpi: No. In some villages I found that almost 40 percent of the male population had the red cell defect, G6PD deficiency; which meant that almost the same percentage were at risk from eating fava beans.

Hicke: Because it's genetic?

Gelpi: Right. This defect is a sex-linked characteristic, which means that the gene responsible is on the X chromosome. Thus males--having only one X chromosome--are at risk from having the defect, while the vast majority of females are only carriers. And these carriers are not at risk, because they carry a normal gene on the other sex chromosome. The rare female with a double dose of the G6PD deficiency gene, that is, a defective gene on each X chromosome, is at risk.

Hicke: So females would pass it on.

Gelpi: Yes, they pass it on to children of both sexes. And as far as the G6PD-deficient males are concerned, they are not only at risk from eating fava beans, but they are also at risk from certain infections--which may trigger red cell damage in the presence of the enzyme defect--and from certain commonly used medications. One in particular, primaquine, is known to bring about hemolysis (breakdown of red blood cells) in G6PD-deficient red cells, and it is commonly used to treat and prevent a certain type of malaria.

Hicke: Is it the same as quinine?

Gelpi: No. It's actually a synthetic which works somewhat like quinine. So, given a situation in which you have a Saudi with vivax (one of four malaria species) malaria and you decided to treat him with primaquine, not knowing whether the individual is G6PD-deficient or not, you have placed the patient at risk of a hemolytic reaction to the drug. And for those Saudis who sometimes were treated with primaquine and would subsequently become anemic, we now had an explanation.

Hicke: Was this commonly known about primaquine?

Gelpi: Yes, it had been; the initial work with primaquine had been done with G6PD-deficient Afro-Americans.

Hicke: So what did you do?

Gelpi: First of all, I was able to find out how prevalent the enzyme defect was in the Saudi population, both within and outside of the oases. Next it was possible to alert our medical staff to the possibility that unexplained, severe anemia in Saudi children was

likely to be due to favism, not malaria or iron deficiency; and that affected children should not again be exposed to fava beans. Saudis should avoid certain medications, which in the presence of G6PD deficiency might cause red cell destruction and acute hemolytic anemia. Doctors should begin to think about the possibility of G6PD deficiency as an explanation for otherwise obscure anemias in adult Saudis, particularly if those individuals were taking medications which interact with G6PD-deficient red cells.

I believe that Aramco doctors began to appreciate the extent of this problem. I'm not so sure about doctors in other medical facilities scattered throughout the Kingdom. Of course this information was published and added to increasing knowledge about the extent of G6PD deficiency in various populations throughout the world. It's clear that the condition is common throughout the Middle East.

Hicke: How do you go about alerting others--through publications?

Gelpi: I believe that medical journals serve as the most important conduit for transmitting this type of information to health care professionals, including public health authorities. And since I left Saudi Arabia, there have been many additional publications describing G6PD deficiency in various parts of the Kingdom; so it is clear that the extent of the problem is well known. I have to assume that over the past thirty years most all of the health care providers in Saudi Arabia have a fundamental understanding of G6PD deficiency, favism, and drug-induced hemolytic anemias in G6PD-deficient individuals.

Hicke: What actually happens when someone eats fava beans?

Gelpi: In a G6PD-deficient individual, red cell membranes are ruptured, and a large proportion of red cells may be destroyed in just a few hours. The large amount of hemoglobin released from the damaged red cells, together with the red cell debris, may cause secondary problems because of kidney damage. But the effects of the acute anemia from the loss of normal circulating red blood cells can be catastrophic--particularly for the elderly, who may have some other debilitating conditions.

Hicke: How long does this last?

Gelpi: The anemia lasts until the bone marrow can replace the lost red cells. If the victim is iron deficient to begin with--as many individuals in third world countries are--recovery may be delayed, and it may be weeks before the red cells reach levels comparable

to that which existed before the onset of the acute anemia. With adequate iron stores, the lost red cells may be replaced in a matter of days.

Hicke: And why were you looking for G6PD deficiency in children?

Gelpi: Because they were more likely to be severely affected. The effects of severe anemia would be more apparent. And iron deficiency plus malnutrition as complicating factors would tend to aggravate the symptoms and signs of red cell loss associated with G6PD deficiency. And this would be more likely to tip the balance in favor of hospitalization.

Hicke: You talk about people known to have this deficiency. Is there some way to test for it?

Gelpi: I employed a simple test, which involved using only a drop of blood collected in a fine, capillary tube. The test consists of detecting red cell G6PD by a specific chemical reaction: a positive reaction indicates the presence of the enzyme. There are more sophisticated tests available, requiring larger amounts of blood, which provide more quantitative information about the enzyme rather than a measure of whether the enzyme is present or absent. These tests also provide information about several types of genetically distinct enzyme deficiency. For example, African blacks and African Americans have a mild type of G6PD deficiency--that is, they are partially enzyme deficient. In the Middle Eastern type, there is complete absence of G6PD activity. Blacks have what is called the B type of G6PD deficiency, whereas many people with the Middle Eastern variant--what we call G6PD Mediterranean, or A-G6PD deficiency. Saudis have the A- variant. A few carry the normal B+ variant. So I found that Saudis had the more severe type of G6PD deficiency, which led to more severe effects on their red cells when exposed to sensitizing drugs.

Hicke: Is there anything you can do to warn people that have G6PD deficiency?

Gelpi: Both on an individual and family basis it was possible to provide counseling. However, I have no idea what has been done throughout the Kingdom in terms of health education about the prevalence and risks from G6PD deficiency. I have to assume that there has been some publicity, based on the number of publications which have appeared in various biomedical journals over the past thirty years. And there are investigators in Saudi Arabia who are still doing surveys. I see the citations about this work in my reading.

Hicke: Maybe testing for it has become routine?

Gelpi: I think it probably is. The condition shouldn't be a stranger to Saudi health care professionals any longer.

Sickle Cell Trait and Sickle Cell Disease

Hicke: What's next?

Gelpi: Well, we could jump ahead to sickle cell disease; but Dr. Richard Perrine and a group from Oxford picked up where I left off, carried out a lot of work, and published a number of papers on sickle cell disease. However, just before my arrival in Saudi Arabia, an anthropologist working for Aramco, in collaboration with a British investigator who was an expert on the worldwide distribution of human blood groups, carried out a survey for blood groups--and incidentally, the sickle cell trait--in the Eastern Province of Saudi Arabia. Their important findings included the observation that the sickle cell trait was quite common in the oases populations. The work was published either in the Lancet or the British Medical Journal; I don't remember which. But it was an article which caught my attention soon after I arrived in Saudi Arabia.

The sickle cell trait is common in Africa, and it is found in about 8 percent of Afro-Americans. But there are places in equatorial Africa where it occurs in more than 20 percent of the population. This trait is a genetic marker, and in itself harmless, except under most unusual circumstances, such as at high altitudes. But sickle cell disease is another matter. Here we have two genes affected--one inherited from each parent. When there are two genes for the sickle trait, the affected person has sickle cell disease. And so the early village survey told me that there might be not only a high proportion of oases inhabitants with the trait, but also an alarming number with sickle cell disease. But if that were so, where was this disease? We weren't seeing it in our hospital or our clinics. The answer was there; we just weren't paying attention.

Adult Saudis seen in our clinics for a variety of medical problems, or hospitalized for, say, appendicitis, would be noted to have a mild anemia. The anemia was usually ignored in favor of dealing with another, more important medical problem. Bearing in mind that blacks and Afro-Americans with sickle cell disease were readily diagnosed, because the severity of their anemia and other complications immediately called attention to the possibility of sickle cell disease, we ought to be seeing patients with

comparable illness due to this disease. Why weren't we seeing this? Were the sickest ones dying off in infancy?

One day I happened to see a Saudi, one of these people with an unexplained, mild anemia who was referred for another medical problem. On examination I found that he had an enlarged spleen. Which prompted me to wonder if the enlarged spleen and the anemia might be related. Well, of course this combination could be due to malaria. But what about the possibility of sickle cell disease? Upon testing he was found to have the disease.

But the medical literature at that time advised us that African blacks and Afro-Americans had severe illness associated with sickle cell disease, and that their spleens were affected in such a way as to become smaller, almost to disappear. On the other hand, every Saudi patient whom I saw with an enlarged spleen was destined to be diagnosed eventually with sickle cell disease. And most adult Saudis with unexplained anemia--later found to be the result of sickle cells disease--when carefully examined, were found to have enlarged spleens.

So here we had people with sickle cell disease which was fundamentally different than the same disease among African blacks and Afro-Americans. Most were without symptoms, and sickle cell disease was an incidental diagnosis. But we had still only scratched the surface; for some of these patients would appear in our clinics and emergency room complaining of various aches and pains. The pieces of the puzzle began to fit together.

It's well known that Afro-Americans and African blacks with sickle cell disease have recurrent bouts of pain, sometimes very severe, in joints and in the abdomen. And the cause of this is the presence of deformed, sickle cells under conditions of low oxygen tension in the small blood vessels. The deformed cells become compacted and obstruct small arteries and veins, causing bone and abdominal pain. So many of our Saudis with previously unexplained pain began to fit into the picture. For often they would be seen with this complaint, thought to have possible appendicitis, peptic ulcer, or arthritis--depending on the location of their pain--and after some pain relief with medication, they would be released, only to return again with similar pain, perhaps at a different site. They were having the same pain, in the same location, as blacks, only the pain was almost invariably milder in comparison.

So the picture emerged of the typical Saudi with sickle cell disease: a reasonably healthy young male with a hemoglobin around 11 or 12 grams/100 ml.--abnormal, because the usual level is around 14 to 16 grams/100 ml.--an enlarged spleen, and an

occasional visit to our hospital or clinics because of joint or abdominal pain. Whereas a young Afro-American, with presumably the same disease, had a hemoglobin level of 7 to 8 grams/100 ml., was having disabling bouts of pain, felt miserable all the time because of chronic anemia, and had a very limited life span because of certain infections and other life-threatening complications.

Hicke: They had a different kind of...?

Gelpi: They had a different kind--or a different expression--of this disease. We know now that there are at least two mutant genes responsible for sickle cell disease. At the time we began research on this condition in Saudi Arabia, I believed--and so did many other investigators--that there was only the African type. We now know that there is a type peculiar to the Middle East--genetically distinct--which produces the same phenomenon of sickling in the red cell, but to a lesser degree, resulting in less severe symptoms. My original suspicion was that the sickle cell gene was imported to Arabia from Africa, and that the mild disease found in Saudis was due to other, protective factors which shielded sickle cells from becoming deformed. But we now believe that an independent mutation occurred in the oases populations of Eastern Arabia or some adjacent location perhaps thousands of years ago. And we have also learned that in fact, the African sickle cell trait is found in western Saudi Arabia, and that homozygous individuals--that is, people with both genes affected--have severe disease.

I was wrong about the source of the sickle cell gene in eastern Saudi Arabia; but I was right about the protective factors which suppress sickling, and thus in part may be responsible for ameliorating the expression of sickle cell disease in Saudis. One of these factors is almost certainly fetal hemoglobin, or hemoglobin F. Others may be the thalassemia traits--common in Saudis--and G6PD deficiency.

But you also have a Darwinian explanation for the occurrence of the sickle cell trait in the Saudi population. As a random mutation, the sickle cell trait, like so many others, should simply disappear or be represented in an extremely small proportion of people, unless it confers some special advantage. There is now a consensus that the sickle cell trait, together with certain other genetic traits which affect red blood cells, makes red cells more resistant to malarial parasites. Among these traits is the hereditary absence of the Duffy blood group. The sickle cell trait protects against falciparum malaria and the Duffy negative status protects against vivax malaria. In fact, the Duffy blood group antigen is the receptor for the vivax

parasite on the red cell. Back in the sixties, it was found that most Afro-Americans were Duffy-negative, and that almost all African blacks were Duffy-negative. But at that time we had no idea about the significance of this except that the Duffy-negative condition was a pretty reliable genetic marker for identifying African gene flow--to other populations, that is.

There are two Duffy gene types, A and B, expressed in various combinations--AA, AB, BB, B-, A-, and O- or absence of both genes. Someone came up with the idea that the Duffy-negative state must confer a selective advantage; but how? It was also well known at the time that African blacks were mysteriously spared from vivax malaria in endemic areas, although many suffered from falciparum malaria. With just a little more serendipity it was established that the absence of Duffy antigens on their red cells protected Africans from vivax malaria.

Back to Saudi Arabia: it occurred to me that if sickle cell disease was prevalent in Saudi Arabia, and if the sickling trait came from Africa, which I believed it undoubtedly did, then there must be another genetic market which would prove the point. Why not look at the Duffy blood group genes in the Saudi population and determine the degree of African admixture? It turned out that between 70 and 80 percent of Saudis in the Eastern Province lacked the two Duffy antigens.

So not only were they protected from falciparum malaria by the presence of the sickle cell trait, perhaps somewhat by G6PD deficiency--for believe it or not, that is now believed to be a protective factor--but they were also protected from vivax malaria by the absence of Duffy red cell antigens in a high proportion of the population. Over many generations, the oases Arabs had developed a unique pedigree composed of multiple genetic traits which made their red blood cells resistant to two species of malarial parasites.

Hicke: I've read someplace that there were black slaves brought into Saudi Arabia. That's obviously within recent history, speaking in Darwinian terms.

Gelpi: Within the past 1,500 years--let's say since the beginning of Islam¹--there was a flourishing slave trade originating in East African ports lasting well into the late 19th century. And there may have been a trickle well into the 20th century.

¹Islam was established by Mohammed (570?-632) and spread throughout the Middle East. Within a century after Mohammed's death, an Arab Muslim empire extended from Spain across central Asia to India.

Hicke: And was that a factor in all of this?

Gelpi: Here we have a convergence of historical and genetic evidence to support the theory that there was a great deal of African admixture into the populations of eastern Arabia. And I thought that this was the explanation for the presence of the sickle cell trait and sickle cell disease. But I concluded that the mild expression of this disease had nothing to do with the possibility of two different sickle cell genes, but that it was the result of the interaction of other red cell genetic markers--fetal hemoglobin and the thalassemias--on the red cells containing hemoglobin S (sickle cell hemoglobin). Yes, they tend to have elevated levels of hemoglobin F, which is protective. And many have associated thalassemia traits, which may also be protective. But they also have a fundamentally unique type of sickle cell hemoglobin.

Hicke: Which they did not get from blacks.

Gelpi: Which they did not get from blacks. But there is some of the African type of sickle cell trait and disease in Arabia, notably along the Red Sea. And we now know that the Saudi variant of the sickle cell trait has spread to other populations in the Middle East, probably farther--to Iran, India, Syria, possibly as far as Greece. For we have known for years that there is a relatively mild type of sickle cell disease in southern Turkey among the Eti-Turks (immigrants from Syria), and in certain areas of Greece and in India.

So the sickle gene has spread widely from the Middle East, as it has from Africa. When I was working on the problem of the trait and the disease in Dhahran, I exchanged correspondence with some Israeli researchers interested in this problem within their Arab population. And they indicated that yes, the sickle cell trait was present, that the expression of sickle cell disease was mild, and that Israelis--even if native born--did not have the trait.

Beyond all this it was possible to show that having sickle cell disease as a Saudi was compatible with a long life and relative freedom from most of the complications associated with this disease in America and in Africa.

When I finally left Saudi Arabia and Aramco employment, I listed all the patients I had followed with sickle cell disease. There were probably fifty or sixty. This was a good group to follow for a longer period, for follow-up family studies. Dr. Perrine and his colleagues from Oxford picked up where I left off, extended the studies, acquired new patients with the disease,

amplified some of the testing which had been done before, and were able to confirm that the Saudis had benign sickle cell disease, and that a lot of the complications characteristic of the disease in Africa and America were not occurring in Saudis. Much of this work has been published, and Dr. Perrine knows a good deal more about it than I do.

- Hicke: You keep talking about malaria as a basic problem. Some of the things that you detected were protecting against malaria. And yet, when I first heard of malaria there, when you told me there was malaria in Saudi Arabia, it seemed hard to believe--because it's a desert. You don't think of water-based diseases there.
- Gelpi: That's true. Most of Arabia is free of malaria because most of the country is a desert. But the oases are rich, verdant areas with an abundant water supply from the wells in the area. It's a totally different environment.
- Hicke: I guess what I'm saying, then, is: would you notice considerable difference between the Bedouins of the desert, for instance, and the people who lived in the oases? You've been talking mostly about the oases.
- Gelpi: As you might have guessed, evolutionary trends in geographically separate populations are likely to be different. There would be major genetic differences. And there are among Saudis. There are very low frequencies of G6PD deficiency and sickle cell trait in the Bedouin. I don't know about the Duffy blood groups, but I imagine there would be similarities because of the African admixture. But in any case, these populations have selected for the presence or absence of these traits over many generations.
- Hicke: Did you work with the Bedouin at all?
- Gelpi: Actually, in many of the town sites in eastern Arabia there is some representation of Bedouins. They are Sunni Muslim. They've been attracted to the oases for a variety of reasons--employment, commerce, and so on. They've become assimilated into village life, but still maintain both their religious and cultural identity, which distinguishes them from the Shi'ite group--the predominant sect in the oases, particularly in the Qatif oasis complex closer to Dhahran, as compared with Al Hasa oasis, which is much farther to the south. But there, the red cell markers which we have been discussing are much less prevalent among the Sunni inhabitants, even though they have resided there for many generations.
- Hicke: There are religious differences, but also cultural?

Gelpi: The Shia and Sunni have different cultures--different attitudes about employment, social status, different marriage customs, and so on. But there are these genetic differences--a matter of time and cultural identity.

Hicke: And environment.

Gelpi: Yes.

Schistosomiasis

Hicke: I also wanted to ask about schistosomiasis.

Gelpi: I'd like to spend some time on it, if only to point out the valuable work that was done on this problem by one of the Aramco people. I won't go into the details of the disease except to say that we saw evidence of schistosomiasis in Arabs who came from other regions of Saudi Arabia, not people who were indigenous to the Eastern Province. The reason is that this disease is another type of worm infection which involves the blood vessels of the intestinal or urinary tract. Two different types of worm infect the intestinal veins, one type affects the veins from the urinary tract. That intestinal type, with which we are concerned, is called Schistosoma mansoni.

The cycle of infection progresses as follows: there is a snail vector and an alternation of generations between the worm which infects humans and that which infects the snail. The snails carry what we call the larval stage; the larva emerges from the snail as a free-swimming form which infects man by penetrating the skin and ultimately arriving in the venous system of the lower intestine, where they mature to adult worms. Adult female worms release eggs, which find their way into the membranes lining the intestinal tract and are excreted in the stool--ideally into water. Here a new variant of the worm emerges--again, as a free-swimming form--which seeks out the specific snail serving as intermediate host to complete the cycle. A similar cycle of events occurs with S. hematobium; but in this case, a different species of fresh-water snail is involved; the larval form--infectious for humans--ends up in the vascular system supplying the lower urinary tract--primarily that of the urinary bladder. And as you might imagine, the eggs are released into the urine and find their way into water to hatch.

The complications from repeated infections of this type result in scarring of the intestine or the bladder. But in the case of

S. mansoni, many of the eggs are carried downstream to the liver. Almost all of the veins from the intestinal tract drain into the liver, which acts as a huge metabolic factory, manufacturing by-products from the incoming load of proteins, carbohydrates, fats, and vitamins. The complications which we saw from S. mansoni infections indirectly resulted from scarring of the liver around the entering veins, called portal veins. This scarring compressed the tiny portal veins, increasing the pressure within the system.

Hicke: The scarring would be a building up of tissue which would...

Gelpi: Which would constrict the blood vessels. Therefore, it would raise the pressure in the veins, which would be transmitted throughout the portal system. The effects of this upon the veins in the stomach and lower esophagus resulted in varices--very fragile varicose veins--just under the lining of the esophagus. The varices would rupture; and so we would see people with the complications of bleeding from the lower esophagus and upper stomach. Otherwise, these victims were not too severely affected by their disease.

Since schistosomiasis was not endemic in the Eastern Province, we were not seeing the disease in locals. Dr. Ivan Alio, who was an epidemiologist assigned to Aramco's Preventive Medicine division, did a large survey in the early sixties which mapped the epidemiology of the disease throughout Saudi Arabia. It turned out that all of our cases were coming from western or central Saudi Arabia. This was because the snail vectors, which were the essential intermediate hosts, were not present in the fresh water sources in the Eastern Province. I could digress and talk more about the disease elsewhere in Saudi Arabia, but because of its technical nature, I would prefer to defer it for editorial commentary.

Hicke: What motivated Dr. Alio to go into this?

Gelpi: He and others were asking certain questions: does this disease exist in the Eastern Province? Is there a risk to the local population from imported schistosomiasis? How much is this risk? And it was important to know the distribution of the disease elsewhere in Saudi Arabia in order to anticipate the possibility of schistosomiasis among Saudis from various parts of the Kingdom already employed by Aramco, or applying for employment.

Knowing that the snail vector did not exist in the Eastern Province answered the question concerning whether or not schistosomiasis could be native to the Eastern Province, or could be imported. And this is the way it turned out. Dr. Alio's research, and its resulting publication, constitute a monumental

piece of epidemiology--probably the best example of its kind--showing the distribution of schistosomiasis in the Kingdom. It was published as a soft-cover, limited edition from a printing source in Riyadh; and there are not many copies in existence. But I managed to abstract the results of the study from a copy in my possession. This is a very important contribution.

Hicke: Is Alio's work still being used?

Gelpi: I have no idea what sort of control measures for schistosomiasis have been developed in Saudi Arabia. But I know that there have been additional publications on this disease in Saudi Arabia from other sources.

Pulmonary Tuberculosis

Hicke: I have two more diseases to ask about: hepatitis and pulmonary tuberculosis.

Gelpi: Tuberculosis, in many ways, was pretty much the same disease you see in socio-economically deprived populations in the United States. We were seeing tuberculosis in Saudi Arabia at a time when the country was rapidly changing into a world-class technocracy of the sort you might expect in Europe and elsewhere in the West.

Much of the disease in Saudis was typical pulmonary (lung) tuberculosis that you might see anywhere. But we were also seeing abdominal tuberculosis, involving the same organs affected by lymphoma, which I discussed earlier. But we also saw tuberculosis involving the lymph glands of the neck--proportionately more than you would expect to see in the United States.

Treatment plans included the drugs which were then available in the United States: streptomycin, para-aminosalicylic acid (PAS), and isoniazid (INH). These drugs were widely used until the seventies.

We now have additional, newer drugs, to combat resistant strains of the tuberculosis organism. How the disease is being managed in Saudi Arabia at this time, I have no idea. But the original combination of streptomycin, PAS, and INH was very effective for us in treating the disease in Saudis.

Hicke: Is tuberculosis dying out?

Gelpi: I believe that tuberculosis is disappearing in Saudi Arabia, because I think that the standards of public health and access to high quality health care have improved remarkably over the past twenty or thirty years. But really, there's not much to add to the tuberculosis story, except to emphasize the confusion between abdominal tuberculosis and abdominal lymphoma which may make the diagnosis so difficult.

Hepatitis

Gelpi: Getting on to hepatitis: I think I can summarize by saying that the disease in Saudi Arabia, as it is in much of the world, is caused by three main viruses--hepatitis A, B, and C. At the time when I was looking at the disease in Saudis, we were not able to make these distinctions; and there is even another virus--hepatitis E--and I'll touch on that a little later. We had not yet divided the hepatitis virus family into four sub-types.

And it wasn't until the seventies that we really started to make headway in identifying the different hepatitis viruses. But at that time we knew how to distinguish viral hepatitis from hepatitis due to other causes, such as drugs which damage the liver. Given someone who was sick, jaundiced, who had abnormal liver function tests, and who had someone else in the family with hepatitis, it was not hard to make the diagnosis. But we didn't actually isolate the virus for purposes of diagnosis because of technical limitations, nor were we able to detect the virus indirectly with blood tests which measure antibody against the virus. And as yet, we were unable to make the distinction between the virus sub-types.

So, we were seeing Saudis with acute liver disease, most likely due to viral infection, and probably not due to drugs--for none of the hepatitis victims were on long-term medications. Most of these people had mild illness, and many did not need to be admitted to the hospital. There were exceptions.

Women seemed to be more seriously affected by hepatitis, and were often admitted to the hospital because of the severity of illness. And those admitted were more likely to die than males of the same age with the same disease. And of those women who died, most were pregnant or had recently delivered a baby. Those who were pregnant, and who succumbed, were likely to be in the third trimester of pregnancy. The point was, given a young Saudi woman with hepatitis who would soon give birth, there was a high probability of a fatal outcome. Why? But the problem was even

more complicated. In pregnant women, hepatitis was associated with a high rate of fetal loss, both spontaneous abortion and miscarriage.

There wasn't any obvious explanation at the time; but there were reports of fatal hepatitis during pregnancy coming from other parts of the world--developing countries--an indication that the problem was widespread. There were papers from Algeria and elsewhere in Africa, from Iran, and from India indicating that viral hepatitis in pregnancy was often fatal. Strangely, viral hepatitis during pregnancy in Western countries, industrialized societies, was not particularly risky. Why this difference? There must be something about third-world social or cultural conditions that makes the disease worse in pregnant women. What could it be? Diet probably; the fatalities were due to malnutrition. Wrong. All other things being the same, hepatitis in Saudis, no matter how well-nourished the victims appeared, was often fatal in pregnancy.

Hicke: Much more so than in Western societies?

Gelpi: Much more so. We now think we have an explanation--not because of the observations I made in Saudi Arabia, but because we have found the culprit--hepatitis E virus--which causes epidemics in developing countries, but also causes sporadic cases of hepatitis. And it has been consistently associated with high fatality among pregnant women--particularly those at term, those women who are about to deliver or have just delivered their babies. This infection is almost essentially water-borne. But we really don't know why this virus is so dangerous during pregnancy. So I can end up by saying that hepatitis A, B, and C is probably much the same in both men and in women, regardless of pregnancy.

It has been suggested that a woman's immune response changes during pregnancy. Not surprising, otherwise if it didn't change, she would reject the fetus, regarding it as being a foreign body in the uterus, but this doesn't happen very often. But we are beginning to think that with immune tolerance of the fetus, there may be tolerance for other, unrelated foreign material, such as the hepatitis E virus.

Hicke: That's really amazing! Are there other instances of such tolerance?

Gelpi: I can't tell you too much about it. Much of what I have told you is speculation--the sort of thing that medical scientists do when they're seated around a conference table engaged in intellectual browsing. We only know that the immune response in pregnancy is different. And we think that the pregnant woman, with occasional

exceptions--obviously, there are spontaneous abortions, now and then--identifies the fetus as self, in spite of the fact that only half of its genetic makeup is derived from its mother. But the maternal immune system identifies this thing, this parasite, this fetus, as self, rather than non-self. Even though the father's genes are there, creating slight differences between the mother's tissues and those of the fetus, the mother's immune system says, "Hey, this is me."

But there may be alternative, totally opposite, explanations for the effects of the hepatitis E virus on pregnancy and upon the pregnant woman. Maybe this virus can run rampant and kill its victim simply because of the large viral load causing large numbers of sick and dying liver cells in the presence of a blunted immune response. But maybe it's the other way around; the immune response may be so vigorous that it is worse than the disease. The damage that's done fighting the virus leaves the liver in wreckage, which is obviously worse than simply contending with a rapidly multiplying virus.

There are various reasons for believing the first hypothesis, based upon what we know about hepatitis from other causes. With other types of viral hepatitis, the virus may be fairly well tolerated, despite the fact that the virus is proliferating and destroying liver cells--so well tolerated that it leads to chronic infection which takes years to disable or kill its victim. That summarizes the problem of viral hepatitis, as well as I can express it.

Hicke: But tell me exactly what you did, your part in all of this.

Gelpi: My part was to look at every Saudi woman with hepatitis in the hospital. I asked to be called on all admissions in order to document the severity of disease, to select certain tests which would tell us the likelihood of survival or imminent demise, so that we could evaluate the effects of supportive care and specific medications on the course of the disease. We wanted to save these people, if possible, by identifying those who were critically ill. It seemed that the best test available for indicating an unfavorable outcome was the prothrombin time--a measure of one of the components of the clotting cascade. If the prothrombin time was abnormal (prolonged), this was almost certainly a death warrant. All the women with significantly prolonged prothrombin times died.

Hicke: So they don't know if there's some remedy.

Gelpi: Based on what we know from multiple reports on the management of fulminant (explosively severe) hepatitis from many sources in the

United States, Canada, and Europe, we have learned that adrenocortical steroids don't work. Although at the time they were first employed to treat potentially fatal hepatitis, they seemed like rational choices to suppress an intense immune response accompanied by marked inflammation--if one believes that the immune response is worse than the infection itself. Whether or not supportive care--intravenous nutrition and fluids, primarily--makes much of a difference, it's hard to tell. In a highly sophisticated, tertiary care medical center, many of these patients would be candidates for liver transplants.

I don't know whether or not fatal hepatitis during pregnancy is still a significant health care problem in Saudi Arabia. I have no reason to think that much has changed, except that the overall incidence of viral hepatitis has probably dropped to a significant degree, and the incidence of fatal hepatitis has dropped proportionately. But I went back after the first study of hepatitis complicating pregnancy and began to look at the cases that had accumulated over a period of five or six years following completion of the original study and its publication. There was a difference in mortality, with apparent improved survival in the later group of patients with hepatitis. I have no explanation for this. The patients may have been selected. Perhaps the strain of virus had disappeared. Those who favor the theory that it was socio-economic conditions and nutritional status which determined the outcome would say, "See, living conditions are better; that's why." But I don't think that's the explanation; it's too easy. But that's the end of the hepatitis story.

V MEDICAL DEPARTMENT ADMINISTRATION

[Interview 3: February 5, 1996]

Reporting to Aramco Management

Hicke: Today we're going to talk about administration in the Medical Department.

Gelpi: The Medical Department, now called Saudi Aramco Medical Services Organization, or SAMSO, was more or less an independent entity within the oil company administrative network. However, the medical director consistently reported to a representative of Industrial Relations, invariably an Aramco vice president. The executive composition of Industrial Relations was continually changing; so that the person to whom Aramco's medical director reported was also changing. In the span of the medical director's tenure, he might be dealing with three or four different IR representatives.

Hicke: And these would be non-medical types.

Gelpi: They were definitely non-medical types, and all had to be successively educated by our medical directors. This, I believe, created a certain inertia in communications and interaction between the Medical Department and the rest of the company. Of all the dimensions of medical administration, this was the worst. Internally, the organization of the Medical Department had a lot to recommend it, and I had no quarrel with the organization of the company outside of the Medical Department. The thread which bound the Medical Department to the rest of Aramco had to be constantly reinforced by repeated education sessions for each IR representative.

Hicke: What kind of decisions would that person be expected to make?

Gelpi: There were three major areas of concern. The first was obviously financial: how much it cost to run the Medical Department year after year. The second had to do with how Aramco's Medical Department was involved with outside agencies, both within and outside of government--because as you already know, Aramco was not only providing medical services for its employees and their dependents, but also for many people who had nothing to do with the company.

The third area involved the expansion of health care; for as the working population of Saudis and their dependents increased, so did the requirements for health care. And much of this care was provided for routine and rather trivial medical problems--immunization, maternal-child health, well-baby clinics, minor injuries, health education, and so forth. So both Aramco management and the medical director had to think about the possibility of providing health care in some other way, rather than simply expanding Aramco facilities and hiring more health care providers.

Hicke: So you really had to keep close contact with Industrial Relations?

Gelpi: There were weekly meetings--maybe more often, depending on circumstances--with the IR representative about matters of mutual concern. And the agenda of some of these meetings filtered down to medical department rank and file in the form of lower level weekly meetings attended by division and unit heads, and memoranda.

Hiring

Hicke: What about hiring?

Gelpi: To a great extent, hiring was an initiative of, and at the discretion of, Medical Department administration. But it obviously had to fit into budget requirements for any given year, and had to meet the approval of company management. As personnel requirements were constantly changing, so was the Medical Department budget. Those changes involving the addition of key personnel needed advance planning to fit budget requirements.

Hicke: So that determined what slots might open, but who actually did the interviewing? I think you've indicated that a few times people would go back to the States to interview.

Gelpi: This would most likely happen in conjunction with a scheduled visit to the States. Typically, a Medical Department division or unit head--say the chief of Surgery--would arrange to interview one or more candidates for the position of surgeon while he was on vacation or attending a meeting in the U.S. Depending upon qualifications and personal impression, one of the candidates would be invited to join Aramco.

Hicke: Now tell me about your participation in this.

Gelpi: As you know, when I joined Aramco in 1959, I was assigned to the Medical Services Unit at DHC. Once again, this unit consisted of Internal Medicine, General Practice, and Pediatrics. Several months later, I became chief of Internal Medicine and chief of the Medical Services Unit. And at that time there were two or three other internists, two pediatricians, and perhaps as many as ten or fifteen general practitioners assigned to various clinics and inpatient services.

At the same time there were two district clinics with attached infirmaries, and each had its own medical director, both reporting to the medical director at DHC. Each had his own medical staff--a small number of general practitioners, some lab technicians, nurses, an x-ray technician, and custodial people. At DHC we had a much larger number of doctors, including specialists, an administrative unit, a large nursing service, rather comprehensive laboratory and diagnostic x-ray services, and a rather large division of preventive medicine involved in all sorts of public health activities, both within and out of the company. Representative division and unit heads all reported to the medical director at DHC.

Hicke: How did the pay of doctors and nurses compare with that of commensurate jobs in the States?

Gelpi: I can't say much about the nurses, but I would say that doctors' pay compared favorably with that of generalists, pediatricians, and internists in the States. This, of course, was back in the late fifties and early sixties. For general and orthopedic surgeons, for ophthalmologists, for otolaryngologists, for radiologists, and for pathologists, I think that the pay was definitely less than what they might expect in the U.S. at the time. So there had to be other attractions to bring people out who were in these specialties.

Hicke: What were these other incentives?

Gelpi: For some it was the opportunity to pioneer in the health care of a developing country--for at that time, despite its oil riches,

Saudi Arabia was a developing country. Even though it sprang ahead during the seventies and eighties, becoming a modern, industrialized country, when I was there, we were really seeing medical problems typical of underdeveloped countries in Asia, South America, and Africa.

No doubt there were other attractions. Some people were especially interested in Middle East cultures. There were unprecedented opportunities for world travel, because of Aramco's generous repatriation and vacation policies, as well as travel allowances. Aramco medicine had its appeal for those who were interested in combining medical research with clinical practice, who wanted to see exotic diseases in an exotic place, who wanted to be on the cutting edge of progress in international health. And so there was something for everybody.

Hicke: Was this pretty well promoted--the opportunities for travel, research, and so forth--before the people were hired?

Gelpi: I don't know, really, what individual basis each of my colleagues had for coming to work in Saudi Arabia. As you know, at the time I was recruited I had the opportunity to make my decision on the basis of a visit to Dhahran before I accepted employment. And within a couple of days it was possible to make up my mind that Aramco offered great opportunities for both research and clinical experience. That was the selling point, as far as I was concerned. The opportunities for travel and to learn a lot about the Middle East and its cultures were both secondary incentives.

Hicke: Did you do any of the actual recruiting?

Gelpi: I did some recruiting. I recall one trip I took with Dr. Taylor. We went to Egypt either in 1961 or '62, both to Cairo and to Alexandria. We were looking for additions to my medical services and his surgical services unit. I don't recall if we came up with any really good candidates. Dr. Taylor may remember more about the trip than I, because besides recruiting, we had some interesting adventures. I don't think we found the doctors we were looking for. I didn't participate in recruiting beyond this, except for inquiries about suitable people when I was in Beirut on other business. Beirut was an attractive source for recruiting because of the American University of Beirut [AUB] medical center and its medical training, and because of the professional quality of both Palestinian and Lebanese doctors. We were definitely looking for interested graduates from AUB.

Hicke: Do you recall any that you got?

- Gelpi: Over the years we got quite a few good doctors. Many would come and stay for a few years, make a little money, and then either return to Beirut or go to the United States for postgraduate training in various medical specialties. Some eventually recycled back to Saudi Arabia; a few returned to Lebanon and other parts of the Middle East. Many remained in the United States.
- Hicke: Would some of your recruits have been Americans?
- Gelpi: No. In Beirut, these were Lebanese, Palestinians, maybe a sprinkling of Arabs from neighboring countries, but mostly Lebanese.

District Visits and Medical Education

- Hicke: Would you tell me a little more about the educational program that you had for doctors when you went to visit the districts away from Dhahran?
- Gelpi: As I suggested during an earlier interview, I believed that there were two activities which might stimulate interest and raise educational standards among Aramco physicians--at least in my group, the Medical Services Unit. Therefore, I started weekly visits to the districts--Ras Tanura and Abqaiq. These were industrial and residential community complexes, each with its own clinic and infirmary. These visits consisted of a noon lecture to the doctors, based on a preceding case presentation, and some consultations on one or more infirmary patients. Usually, there were one or two people in the infirmary with medical problems needing bed rest, but not severe enough to warrant hospitalization at DHC. I would finish by seeing patients in the clinic, referred for various problems. Most were Saudis. And I would alternate my visits: one week it would be Ras Tanura, the next Abqaiq. I did this for the eight years I resided in Saudi Arabia. I really can't recall whether or not the district visits were continued. I know that when I returned, during the seventies on locum tenens basis, I was not involved with district visits, nor was I aware that they had continued in my absence.

I guess that the visits had some value, both for the doctors and the patients in the districts. I think that it brought the doctors closer to DHC in spirit. We came to understand one another's problems better. We got an appreciation--at least I did--for some of the difficulties faced by doctors at a distance from DHC. And so I think that in the long run, it was a beneficial arrangement.

Hicke: What subjects might be included in your lectures to the doctors?

Gelpi: A typical district visit might include the case presentation, on ward rounds, of a patient with, say, hepatitis. This patient would be presented by one of the district physicians; and then it was up to me to give an extemporaneous lecture on hepatitis, which I would do as best as I could under the circumstances. I never knew ahead of time what was wrong with the patient; and that was part of the game. So the excitement was generated by the possibility that the doctors had come up with a diagnosis or disease I hadn't read about. For me there was the exhilaration of trying to keep up to date, and to anticipate the kinds of patients who were being presented. My lectures lasted about fifteen to twenty minutes.

At these noon meetings we would talk about other issues relating to the presentations. If hepatitis was the disease under discussion, there would be questions and an exchange of views on diagnosis and management. We'd then finish lunch and return to work. I would be seeing clinic patients for the remainder of the afternoon; and at the end of the working day, I would jump into my car, a taxi, or a bus--depending upon availability--and go back to Dhahran.

Hicke: Who headed these clinics that you remember? There were a lot of different people, but...

Gelpi: Medical directors were appointed specifically for the districts.

Hicke: Can you give me the names of some people?

Gelpi: There was Dr. Armbruster, who was director of the Ras Tanura clinic/infirmary when I arrived in Dhahran, and there was Dr. Les McCoy, who left the medical service at DHC shortly after my arrival, as the director of the Abqaiq clinic/infirmary. Dr. Armbruster's major interest was occupational medicine; Dr. McCoy's, internal medicine--actually, he had been trained as an internist. Of course the medical directors in the districts changed--not year by year, but there were several changes while I was employed by Aramco.

Hicke: The other thing I wanted to ask was if you had any anecdotes that are particularly memorable.

Gelpi: It's hard to remember the little things. There are a few which I have already talked about: the consultative visit to see the ruler of Qatar, the trip to Riyadh to take care of the minister of agriculture and immediate members of the royal family, and the

other trip to Qatar involving investigation of the poisoning epidemic.

More on the Journal Club

Hicke: Now the journal club. We talked about it before, but I wonder if you could elaborate a bit more.

Gelpi: Our medical journal club developed along traditional lines, and resembled those that have existed for generations of physicians who have been involved in academic medicine, particularly in the United States. A journal club consists of a group of physicians who meet regularly, in an informal setting, to discuss the contents of various medical journals--reviewing articles of particular interest, exchanging information and opinions about the topics covered, and passing judgment on the quality of research and the merits of its publication.

Another way to do this--perhaps more profitably for a small group meeting at infrequent intervals--is to have one of the doctors pick a favorite topic and go into it in detail, using articles from various journals to highlight a particular point he or she wishes to convey to the group. To just go through a journal by listing its table of contents and commenting briefly about each article doesn't seem to be a useful educational tool. Anyway, that's how we started our journal club--meetings and discussions built around specific topics. As far as I know, the journal club established at DHC was still going long after I left. I'm pretty sure that when I made my last visit to Dhahran in 1981, it was still going.

Hicke: Who was part of the club?

Gelpi: When we started there were three internists and a few interested general practitioners (GPs). Then more people began to be interested--more GPs and doctors from the districts. The pediatricians were not interested, because the topics were not related to their training or experience in managing diseases of childhood and infancy. And certainly, the surgical staff was not particularly interested, for similar reasons. Some of the medical directors in the districts became interested. So we began to have quite a following. By the time I last visited, in 1981, the medical department had expanded considerably, and I presume there were many more internists and GPs in attendance.

Hicke: I think you said the journal club met monthly, as most journals are published monthly. And who would set the agenda?

Gelpi: When I was there, I would set the agenda. Then when I left, it was set by my successors.

VI RESIGNATION AND RETURN VISITS TO DHAHRAN

Leaving Aramco

Hicke: Tell me about your decision to leave.

Gelpi: There are several reasons for this decision. I left Dhahran on a combined vacation/sabbatical leave in the summer of 1967. I had planned to work in the Department of Physiology at Stanford to improve my laboratory skills in immunology, so that I could return to Arabia and work on the immunology of ascaris infections. When my family and I were in the United States, I began to consider the long-term question of indefinite employment with Aramco versus the option of putting down roots and pursuing a medical career in the States. We were concerned about moving our children from a protected educational environment in a family setting in Saudi Arabia to schools in the U.S. or elsewhere. This meant a change in primary education for our three children, from grades 1-9 in Saudi Arabia, to high school in the U.S., Beirut, or Europe. Finally, there was the question of whether medicine and health care would continue to be as challenging for me in Saudi Arabia as it had been when I arrived.

In the eight years I had been in Saudi Arabia, I was seeing a rapid evolution of health care and a distinct change in the spectrum of medical problems. We were seeing older patients with Western diseases. Most of the exotic diseases were being eliminated, or had been eliminated.

Hicke: Your successes were eliminating some of the challenges?

Gelpi: Yes. So I was considering all these questions during my sabbatical year. In time, I decided that I would have to put down roots sometime. So after eight years of living abroad, it was time I settled in one place. Palo Alto, with its proximity to two major university medical centers, seemed to be the ideal place to

begin a new career. I knew that the transition from grade school to high school, no matter whether it began in Dhahran or the States, would be traumatic. But in Dhahran, it would be worse, because there would be geographical separation of our children from us and from one another.

Hicke: Highschoolers have to go to boarding school, don't they?

Gelpi: Right. We had not reached this point with our children yet. In any case, it looked like a new career in the States would not be as exciting as that with Aramco. But there was another question: whether or not I could spend more time on research while working for Aramco, or would be consigned to less stimulating clinical activities. So we decided to return, as a family, to the U.S. We had found that there were many attractive features to life in the Bay Area at the time. And perhaps the time had come to leave Aramco and Saudi Arabia; and so we did.

Meanwhile, all of our personal effects had been put in storage in Dhahran. And the prospect of moving them back--either to our home in Dhahran, or a new home in Palo Alto--was not very attractive. But this may have been the decisive consideration: for in a sense, we had already moved out of Dhahran and Saudi Arabia. To have returned meant unpacking over 100 boxes and a move to another house in Dhahran. I felt an obligation to return to Dhahran alone, leaving my family in a newly purchased home in Palo Alto, in order to work until a replacement could be found for me. Several months later, just short of 1969, I returned to the States. I took a job with the Office of Economic Opportunities as medical director of a new clinic for disadvantaged residents of East Palo Alto. And of course, that is another story.

Hicke: Yes. Well, you did a lot.

Gelpi: But this was not the end of my relationship with Aramco. Because in 1974 I began a series of five summer visits (1974-1978) to continue some of the research I had begun earlier, and also to provide vacation relief for physicians in internal medicine.

Medical Research in Dhahran, 1974-1978

Hicke: Tell me about this in more detail.

Gelpi: I was doing work on red cell genetic markers, which included sickle cell trait, G6PD deficiency, blood groups, but was also

doing the reviews which would lead to an additional publication on hepatitis in pregnancy.

Hicke: What was the time period on that?

Gelpi: I spent four to six weeks each summer in Dhahran for five consecutive years. On occasion, I was able to employ a college student, whose parents were living in Dhahran, to work with me during the summer months. I would show them how to do the laboratory work, and hire them on as laboratory assistants. This slowed me down, but I think that it was worthwhile for the students. And it eventually allowed me the extra time to devote to clinical activities.

Hicke: Were these medical students?

Gelpi: Some were pre-med, some were interested in biomedical research, and some were simply liberal arts majors.

Hicke: What resulted from these follow-up studies?

Gelpi: I completed the research, and this led to about a total of eight to ten publications. I finished the investigations on red cell genetic markers; and I finished the work on hepatitis complicating pregnancy, for publication. That wound up my research activities in Saudi Arabia. But I made a final visit in 1981, as a substitute for another physician on leave.

Hicke: How long was that for?

Gelpi: I was in Dhahran for a month. My oldest son was working for Aramco and living in Dhahran at the time; so we got to see each other rather often.

Hicke: I wonder how he got interested in that! [laughs]

Gelpi: Well, that's another long story.

Hicke: All right. We'll stop here, and you can fill in any details when we do the transcript. Thank you very much.

Transcribed by Lisa Vasquez

Final Typed by Shana Chen and Shannon Page

Regional Oral History Office
The Bancroft Library

University of California
Berkeley, California

Aramco Medical Department Oral History Project

Richard Handschin

PREVENTIVE MEDICINE AND MEDICAL DIRECTOR: 1958-1968

An Interview Conducted by
Carole Hicke
in 1996

Since 1954 the Regional Oral History Office has been interviewing leading participants in or well-placed witnesses to major events in the development of Northern California, the West, and the Nation. Oral history is a method of collecting historical information through tape-recorded interviews between a narrator with firsthand knowledge of historically significant events and a well-informed interviewer, with the goal of preserving substantive additions to the historical record. The tape recording is transcribed, lightly edited for continuity and clarity, and reviewed by the interviewee. The corrected manuscript is indexed, bound with photographs and illustrative materials, and placed in The Bancroft Library at the University of California, Berkeley, and in other research collections for scholarly use. Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, partisan, deeply involved, and irreplaceable.

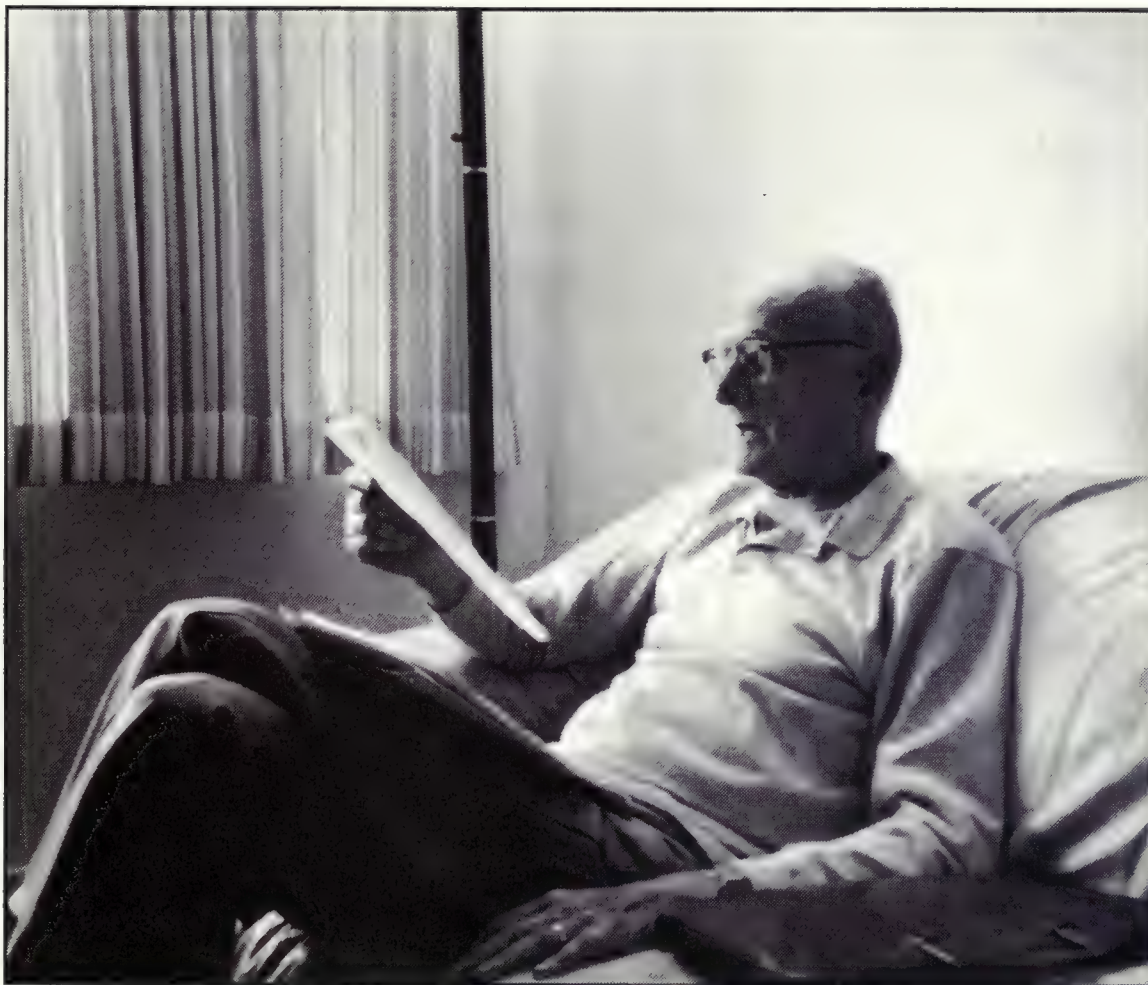
All uses of this manuscript are covered by a legal agreement between The Regents of the University of California and Richard Handschin dated November 7, 1996. The manuscript is thereby made available for research purposes. All literary rights in the manuscript, including the right to publish, are reserved to The Bancroft Library of the University of California, Berkeley. No part of the manuscript may be quoted for publication without the written permission of the Director of The Bancroft Library of the University of California, Berkeley.

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It is recommended that this oral history be cited as follows:

Interview with Richard Handschin, an oral
history conducted in 1996 by Carole Hicke
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Regional Oral History Office, The Bancroft
Library, University of California,
Berkeley, 1998.

Copy no. _____



Richard Handschin, November 1997.

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INTRODUCTION--Richard Handschin, M.D.

Dr. Handschin obtained his M.D. degree at the University of Rochester (Rochester, New York). His postgraduate training included a residency in public health and a masters program at the School of Public Health, University of California, Berkeley, where he obtained his M.P.H. He joined Aramco's Medical Department in 1958, on the staff of the Preventive Medicine Division. He was instrumental in developing the division's strong health education, maternal-child health, and occupational health programs. He did much to integrate preventive and clinical services, both as head of Preventive Medicine, and subsequently as medical director.

Handschin was a pioneer in developing Aramco's remarkable public health outreach activities--a model for corporations abroad, and for developing countries. Because of special family needs, he retired early from Aramco (1968) and went on to join Seattle, Washington's, Group Health Cooperative (HMO) as research director. At the time of this interview, he was ailing with chronic obstructive lung disease, from which he died on April 25, 1997.

Armand P. Gelpi, M.D.

December 9, 1997
Sonoma, California

INTERVIEW HISTORY--Richard Handschin

Richard Handschin served the Aramco Medical Department from 1958-1968. Joining the company as epidemiologist, he was promoted the following year to chief, Preventive Medicine. In 1964 he was appointed medical director and remained in the position until he left Saudi Arabia in 1968.

Born in 1918 in Champaign, Illinois, Handschin grew up there and took his B.A. in Economics at the University of Illinois in 1942. He served in the U.S. Army 1942-46, then took pre-med training in California and obtained the M.D. from the University of Rochester in 1953. Four years later he received a degree in Public Health Administration at the University of California. He was eminently qualified to contribute to and later to direct the Aramco Medical Department.

Handschin has the highest praise for the medical director who hired him, Dr. Richard Daggy. Handschin speaks warmly of Daggy's creative and persevering efforts in preventive medicine on behalf of the Saudis, whether company employees, their dependents, or villagers in the Eastern Province.

The discussion in Handschin's oral history covers diseases treated and research undertaken, other staff members and personnel, and reporting procedures. His recollections are most valuable, however, for the statistical data and careful notes he brought to the interview. Using the outline sent by the interviewer, he describes his work in detail, but most importantly, he offers statistics on the enormous difference made by the work of the medical department, both in patient care and in preventive medicine. His notes and data cover mainly the years he was there--1958-1968--but in just these ten years, the progress in public health was impressive.

Richard Handschin died April 25, 1997. He did not have the opportunity to review the transcript of the oral history, which was recorded on November 9, 1996, in Seattle, Washington. The transcript was reviewed by the interviewer and by Dr. A. P. Gelpi.

Carole Hicke
Interviewer/Editor

June 11, 1997
Regional Oral History Office
University of California
Berkeley, California

Regional Oral History Office
Room 486 The Bancroft Library

University of California
Berkeley, California 94720

BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

Your full name Richard Handschin

Date of birth October 17, 1918 Birthplace Champaign, IL

Father's full name Walter Fredrich Handschin

Occupation Professor of Agriculture Birthplace Calumetville, WI

Mother's full name Edith Knott Handschin

Occupation Teacher Birthplace Mt. Clare, IL

Your spouse Ula Steffani Handschin

Occupation Secretary Birthplace Maitland, CO

Your children Linda (46), David (43), Daniel (41), Lori (38), Rik (36)

Where did you grow up? Urbana, IL

Present community Bellevue, WA

Education U of IL (B.A. 1942); U. of Rochester (M.D. 1953);
U.C. Berkeley (M.P.H. 1957)

Occupation(s) Economic research & teaching (7 yrs.); preventive medicine
(7 yrs.); Medical Director (4 yrs.); Research Director (15 yrs.)

Areas of expertise Analysis, planning and monitoring for health care
organizations (until 1983)

Other interests or activities The 19-member Puget Sound Handschin clan
(including spouses) all live within 15 minutes. They are my major
interest.

Organizations in which you are active Silver Glen Cooperative -- a senior
housing cooperative where I, my wife and son live among 180 active
senior co-op members.

Richard HANDSCHIN M.D., M.P.H

Age 78, died April 25, 1997. Born in Champaign, Illinois on October 17, 1918 to Walter and Edith Handschin, he graduated from the University of Illinois in History and Economics. While serving as a combat medic in the 96th Infantry Division, he was awarded the bronze star for bravery and began his lifelong interest in medicine and public health in 1947 he and Yulanda (Ula) Steffani began fifty years of love, adventure and mutual devotion, as he attended the University of Rochester School of Medicine. He moved to Medina to complete his internship with the U. S. Public Health Service and residency with the Seattle-King County Health Department. He earned a Masters of Public Health from U. C. Berkeley, and in 1958 joined the Arabian American Oil Company in Saudi Arabia, becoming Medical Director of a staff of 1000. He worked closely with the Saudi government on its public health programs, lectured at the American University of Beirut and worked with the World Health Organization in Africa, Asia and South America. He and his family spent ten years in Arabia as avid travelers, an interest he attributed to his early exposure to National Geographic. He relished memories of many family driving trips across Saudi Arabia, the Middle East, Europe and the U.S. In 1968 the family returned to the Eastside where he became Group Health's first Research Director, helping to plan the rapid growth of the Cooperative and design the Eastside Medical Center. He remained a Clinical Associate, Preventive Medicine at the U.W. School of Public Health for 28 years. He offered selfless assistance to colleagues and recently contributed to a history of medical pioneers in Saudi Arabia. He was known for his incredible integrity, corny puns, inquisitive mind, wonderful ability to listen, patience and total devotion to his family. He was an eager, lifelong learner, with diverse interests in such topics as language, history, culture, food, the Sonics, and his family's Italian and Swiss genealogy. He especially enjoyed activities with his special son, Rik, who continues to reside at the family home. He is survived by his loving wife Ula, their five children; Linda (Ken) Sheppard, David (Sharon), Daniel (Lori), Lori (Jay) and Rik, and seven grandchildren, whose individuality he celebrated: Shannon (Scott), Kyle, Kelsey, Richard, Steffani, Robert and Erin. He was predeceased by his beloved sister Margaret van Amerongen in 1982 and by his much admired brother Robert Handschin, on the morning of his own death. At his request, there will be no services, and remembrances may be sent to the Multi-Service

OBITUARIES

Dr. Richard Handschin, loved medicine, gaining knowledge

BY CAROLE BEERS
Seattle Times staff reporter

For Richard Handschin, being on the road was one of life's higher callings, whether it was an actual highway or a path to knowledge.

As medical director for 70,000 employees of Arabian American Oil Co. in Saudi Arabia, he took many trips with his family through the Middle East and Europe.

And as Group Health Cooperative's first research director, he oversaw construction of Eastside Medical Center in Redmond, while quenching his thirst for knowledge through reading, listening and travels in North America.

"A constant theme of his life was education," said his son, Daniel Handschin of Redmond. "His real interest was problem solving, and helping people directly."

Dr. Handschin died of chronic obstructive pulmonary disease Friday (April 25). He was 78.

"He taught us all that family came first, and the love of learning," said his daughter, Linda Sheppard of Bellevue. "He was interested in everything and everybody."

Born to teachers in Champaign, Ill., Dr. Handschin earned his undergraduate degree in economics and history at the University of Illinois. He earned a Bronze Star as a combat medic in World War II. His medic work inspired him to go into medicine and public health.

After graduating in 1953 from the University of Rochester in New York, he moved to Medina and

interned with the Seattle-King County Health Department. Dr. Handschin played a major role in the immunization of area children against polio.

He earned a master's degree in public health at the University of California at Berkeley in 1958, then went to Saudi Arabia, where he helped the Saudi government improve public-health programs.

During these years he also lectured at the American University of Beirut and worked with the World Health Organization in Africa, Asia and South America.

He returned to the Eastside in 1968 to become Group Health research director. He also served as a clinical associate in preventive medicine at the University of Washington School of Public Health. He retired in 1983, but acted as a consultant on clinical papers.

Dr. Handschin stepped up his reading, ethnic cooking, and work on his Italian-Swiss genealogy — and left his children a legacy of learning.

"Like him, I try to be a good listener," said his son. "He treated everyone as an individual and listened to them intently, to learn of their interests and their life."

Other survivors include his wife of 49 years, Yulanda "Ula" Handschin of Bellevue; his children David Handschin and Rik Handschin, also of Bellevue; and Lori Handschin, Kirkland; and seven grandchildren.

At his request, there will be no services. Memorials may go to the Multi-Service Centers of North and East King County, 16225 N.E. 87th St., Redmond, WA 98052.

I BACKGROUND

[The accompanying resume was furnished
by Dr. Handschin]

12/63
CURRICULUM VITAE
RICHARD HANDSCHIN, M.D., M.P.H.

PERSONAL DATA

Born: October 17, 1918, Champaign, Illinois
Married, 5 children, ages 8 through 18
Military and Uniformed Service:
1942-1946 - Combat Medic, U.S. Army, Pacific Theater.
1953 to date - U.S. Public Health Service Commissioned Reserve Corps.
Active Duty, 1953-54. Inactive Reserve, 1954 to date. Current grade: Surgeon.

PROFESSIONAL EDUCATION AND TRAINING

1942 - B.A. in Liberal Arts (Economics), University of Illinois, Urbana
1942 & 1946 - Graduate student in Economics, University of Illinois, Urbana
1953 - M.D., University of Rochester, New York
1953-1954 - Rotating Intern, U.S.P.H.S. Hospital, Seattle, Washington
1954-1956 - Preventive Medicine Residency, Seattle-King County Health Department
1957 - M.P.H. (Public Health Administration), University of California, Berkeley
1962 - Executive Program in Business Administration, Columbia University (6 weeks)
1963 - In-company Managerial Grid Seminar, Saudi Arabia (1 week)

PUBLIC HEALTH EXPERIENCE

1947-1949 - Research Technician, California State Disability Insurance Program
Sacramento (2½ years). Workload and cost estimation.

1952 (summer) - Research Technician, California State Department of Health
Nutrition Study, San Mateo, (3 months). Project coordination.

1955-1956 - Overlapping appointments as Director of Communicable Disease
Control and Epidemiology (9 months) and District Health Officer (21 months)
Seattle-King County Health Department.

1957-1958 - District Health Officer, Seattle-King County Health Department
(9 months). Suburban and rural area, 20 nurses and sanitarians.

1958-1959 - Epidemiologist, Arabian American Oil Company, Dhahran, Saudi
Arabia (20 months). Communicable disease investigation and control.

1959-1964 - Chief, Preventive Medicine, Arabian American Oil Company,
Dhahran, Saudi Arabia (5 years). Direction of preventive industrial and
community public health services for 12,000 employees and 60,000 dependents.
Administered 3 physicians and 80 other professional and technical personnel;
responsible for \$700,000 annual total expenditures.

HEALTH SERVICES ADMINISTRATION EXPERIENCE

1964-1968 - Medical Director, Arabian American Oil Company, Dhahran, Saudi Arabia (4 years). Direction of comprehensive health care system serving 72,000 persons in 50,000 square mile area. 450,000 outpatient visits and 100,000 days of hospitalization annually in 5 hospitals totaling 450 beds (3 of hospitals accredited by JCAH). 80 full-time physicians and dentists, 950 total health service employees. \$14 million total annual expenditures. (For further details see attached publication). Frequent advisory and administration contacts with other private and government health services in Saudi Arabia and with World Health Organization.
1/6/69 - Research Director for Group Health Cooperative of Puget Sound

TEACHING AND ACADEMIC EXPERIENCE

1942 - Research Assistant in Economics, University of Illinois, Urbana (9 months).

1946 - Teaching Assistant in Economics, University of Illinois, Urbana (1 semester). Taught 2 upper class courses in Economics.

1955-1956 - Clinical Associate in Preventive Medicine, University of Washington, Seattle (1 academic year). Taught course in public health aspects of communicable disease to student nurses.

1960-1962 - Lecturer in Public Health and Lecturer in Epidemiology, American University in Beirut, School of Public Health. Occasional lecture or seminar with public health or medical students.

1968 - Instructor, Aramco In-company Managerial Grid Seminar. 3 week-long concentrated courses in advanced management techniques to 180 members of middle and upper level Aramco management.

PUBLICATION

"Integrated Preventive-Curative Services in Aramco", pp. 25-30, Industry and Tropical Health: VI, Industrial Council for Tropical Health, Harvard School of Public Health, Boston, 1967.

OTHER PROFESSIONAL QUALIFICATIONS

Currently licensed to practice medicine in Washington and California.
Certified in Public Health, American Board of Preventive Medicine - 1960

PROFESSIONAL SOCIETY MEMBERSHIPS (M) OR FELLOWSHIPS (F)

American Public Health Assn. - Medical Care Section (F); American College of Preventive Medicine (F); Royal Society of Tropical Medicine and Hygiene (F); King County Medical Society (M); Washington State Medical Association (M); American Medical Association (M); Zeta Chapter, Delta Omega Honorary Public Health Society (M); American School Health Association (M); American Society of Tropical Medicine and Hygiene (M); Royal Society for Promotion of Health (M); Association of Military Surgeons of the U.S. (M); American Association of Public Health Physicians (M).

II JOINING ARAMCO

Interview and Hiring

[Date of Interview: November 7, 1996] ##

- Hicke: We have your background and so I'm going to start this morning by asking how you happened to hear about Aramco and how you first joined the company.
- Handschin: Well, I saw an ad in the American Journal of Public Health for an epidemiologist. I'd always had an interest in Saudi Arabia, dating way back to my exposure in National Geographic magazines as a youngster. I had just completed training in public health at the University of California, Berkeley, and I wrote and got a job description of this job. It was an exceptionally and precisely descriptive job description. I had just been drafting some job descriptions for the Seattle-King County Health Department, so I knew the difficulty of writing good job descriptions.
- Hicke: Yes, it is an art.
- Handschin: And this was a superb description. And then I noted that it had been drafted by R.H.D., which stood for Richard Daggy. If someone were to be hired, they would work under him directly. I thought, "Oh, that would be a wonderful opportunity."
- Hicke: You had heard of him?
- Handschin: No, never had heard of him. So, that's how I heard about it.
- Hicke: And this was 1958?
- Handschin: This was 1958. Then I made arrangements to travel--

- Hicke: You sent an application; and were you interviewed for the job?
- Handschin: Yes, I was interviewed, but I don't remember the details. Much of what I have been able to recount now comes from notes that I had used for speeches.
- Hicke: Well, you don't think about those things for decades and so it's hard to retrieve them.
- Handschin: I was interviewed, but I don't recall the details. Then the decision. We had four children at the time, the fourth child was just about to arrive, and my wife had been enthusiastic but she also had her fingers crossed. We were told at the tail-end that there would be up to an eighteen-month separation. It turned out that I left in April and my wife was able to join me in October of 1958--so eighteen months shrunk to around six months instead. But that was still far too long.
- Hicke: Meanwhile she had the baby.
- Handschin: Born on the third of March, and I left on 30 April.

Moving to Saudi Arabia

- Hicke: What were your first impressions when you got off the plane?
- Handschin: At that time there was not really a terminal. There was an open quonset hut there when we got off the plane. The terminal was, I believe, under construction at the time. Dick Daggy met me. When he did, we were all standing underneath this quonset hut with the wind blowing through, and he pointed out that the chairman of the board was standing right next to us--and he was dressed quite casually.
- Hicke: Who was the chairman?
- Handschin: I'm blanking--
- Hicke: Okay.
- Handschin: Anyway, Dick Daggy himself--I was surprised--was wearing a nice, button-down shirt. I thought, "Oh, this is a nice mixture here of casualness and yet people who were savvy and on board."

Then Dick arranged really an excellent orientation for me. I visited not only all of the Aramco medical facilities, but I spent a long time talking with the Dhahran people. I also was introduced to the two local hospitals, and spent a fair amount of time there. At those hospitals, they spent a lot of time showing me around the two largest oases from which populations many of the of the employees were derived and where most of their families were living.

Hicke: That would be Qatif?

Handschin: That's right. And the Al-Hasa oasis near Hofuf. Some of the people commuted back and forth to there, but some of them actually only went home on weekends.

Then he gave me stacks of material that he had gathered-- statistical data and reports for review. I think that it was at the executive committee meetings of the Medical Department where I got to learn a good deal of the inner functions of the government. Everyone had excellent orientation.

III EPIDEMIOLOGIST, 1958-1959

Annual Malaria Survey

Hicke: Did they want you to learn any Arabic?

Handschin: I took some Arabic courses, but I never really became very fluent--partly because I myself wasn't really involved directly in patient care, although I did participate in the annual malaria survey, in which we went into the villages and examined all children of the village. All of the children would be brought in, and we would examine them for the enlargement of their spleen, which is an indication of infection with malaria.

I participated in that, and I learned enough Arabic to be able to give instructions to the parent or the child while I was examining them. Of those that had the enlarged spleens, we took some blood specimens. In this manner we kept the tally of what was going in the way of malaria. These young children, who were completely susceptible, were kind of our sentinels to tell us what was going on in the way of malaria transmission in individual villages.

So, it was really a great experience. I was on cloud nine. My children and my wife were not there; I was able to put in many hours a day and many days of the week absorbing all of this, and it was really quite exhilarating.

Other Staff Members and Personnel

Hicke: Yes. Who else was there at the time that you recall meeting?

Handschin: At the time, Dr. Page was the medical director, Daggy was chief of Preventive Medicine. I spent some considerable time with Roger Nichols. Roger was the physician in charge of trachoma research in Saudi Arabia. Over the years, I developed a very close relationship with Roger.

Hicke: I talked to Elinor also when I was in Massachusetts.

Handschin: Oh, great, great family.

Those were people whom I had closest relationships with initially at that time. Then I got started as an epidemiologist there, which is what I'd been hired for. The first responsibilities I had were to review the disease-reporting system that had been installed, to critique it and analyze the data; to follow up on some data that we had, looking for sources and methods of infection, and start to draw, tentatively, some control mechanisms.

Tuberculosis and Smallpox

Hicke: Were there any particular diseases you were concentrating on?

Handschin: Malaria had been addressed fairly well, and I can comment on that later. But one of the diseases that had not been well addressed was tuberculosis. I tried to search out as much information as I could on the occurrence of that. Early on we started planning a 100-percent survey chest x-ray of all employees, which had never been done--partly because of the expense.

In doing that, I had the good fortune to work with the physician here in Seattle-King County, who had been a leader in mini-chest x-rays. They were small films that were only seventy millimeters, twice the size of a thirty-five millimeter film. And this man had interpreted over a million of these in the Pacific Northwest and Alaska and was able to do it at a high rate of speed and with a high degree of accuracy. Working with him--and I actually brought him out to Saudi Arabia--we developed a program in which all persons were x-rayed. Close to 99 percent of our employees were x-rayed over a period of time, and at the same time, smallpox vaccinated. So this was one of the first major undertakings that we got off. We were able to do that by the end of '59, and it worked out fairly well.

Hicke: It wasn't all in Dhahran?

Handschin: Oh no. We had to go to all of the major installations in order to accomplish that.

Hicke: And did they bring in the people from the exploration camps?

Handschin: The people from the exploration camps rotate anyway, so we were able to pick them up on their rotation. It was a considerable effort, and loaded the bases, then, for really being able to identify the infected persons and start up an excellent program. Subsequently we started developing a manual on how to continue to care for those had been identified, because they were being cared for on an out-patient basis. Many of them were able to work and, at the same time, be non-infectious by having them on adequate antibiotic therapy.

Hicke: What about the families of the infected?

Handschin: The families of those people were also brought in for screening to see if there'd been propagation of the disease within the household; and they were placed under care too.

Hicke: And also they were vaccinated for smallpox?

Handschin: That had been a separate program. We didn't have a program of x-raying these people; we didn't x-ray them with the mini unit. We brought them in individually and they were x-rayed with a large film. I'm not quite sure when we instituted a program for routine smallpox vaccination, but I don't think it was at that time, because they hadn't really started to work with the major clinics on how to address some of the more significant health problems particularly with dependents.

Personnel in Preventive Medicine

Hicke: If I interrupt you with a question that you're going to talk about later on, you can just say so. But there are some things that I don't want to pass up, like when you say, "We were doing this." Who was the "we"? Was somebody working with you? Did you have nurses or some other kind of staff?

Handschin: We'll talk about that later too, on how we organized. In large measure, the people in Preventive Medicine were staff people who did organizational work, developed programs, and assisted in their implementation, but they didn't actually direct them--with some exceptions. Initially, for example, I myself had a highly capable Indian clerk--the best secretary I've ever had.

I had an Indian clerk and the part-time services of a Lebanese lab technician, who was quite fluent in Arabic. I used him if and when I needed to.

At that time, there were about seventy people in Preventive Medicine. That included sanitary engineers, a lot of sanitary technicians, health education people in particular. Then we had entomologists doing insect control and mosquito control, assisting and advising the Ministry of Health on control. All these things were going on. I never acted with those people and was a member of their team, but they were doing their thing and I was working predominantly at that time in communicable disease.

Hicke: Was most of this set up by Doctor Daggy?

Handschin: Yes. Great guy. Did--?

Hicke: I did; I talked to him also.

Handschin: Oh, did you? Wonderful guy. How was his health at the time?

Hicke: He had had a stroke a year before I think, but he was doing quite well.

Handschin: Is that right? Great admiration I have for that guy.

Hicke: Everybody seems to think he is a wonderful person.

Handschin: Yes, highly admirable man.

I didn't really see very many patients, although I asked to see some patients as people who were being diagnosed with particular diseases that I had interest in or that I knew very little about. I asked the clinicians to give me a call and I'd come down and watch them as they examined or as they continued to care for patients, kind of get a feel and ask questions as to how the disease might have been propagated or acquired and how it affected other people in the family and so forth. I had very little contact, really, in the main, with patients at that time.



Dr. Richard Handschin.

IV CHIEF OF PREVENTIVE MEDICINE, 1959-1964

Responsibilities

Handschin: After I'd been there--I forget--it was about fifteen months or so, about a year and a half, Dick Daggy was suddenly advanced to medical director, even though he was not a physician, but he was a very skilled person in dealing with people, far more skilled than I, in fact. So Dick advanced and he kind of sucked me up with him. [laughter] I became the chief of Preventive Medicine at that time, with the responsibility of doing some overall planning and operating of an environmental health program, being aware of, assisting, and directing the sanitary engineering, insect and rodent control. We had a small public health laboratory that did work related to disease transmission.

Hicke: Such as?

Handschin: We did, for instance, some of the TB [tuberculosis] work. We did the work on tuberculosis cultures and so forth. We did a lot of work on malaria specimens. We did some work on samples of milk and water specimens.

Hicke: Was this separate from the rest of the laboratory?

Handschin: Yes, it was. It was a separate establishment.

Dick had already recruited by that time an industrial hygienist to work with toxic substances, of which there are a number in an oil industry. And one of the most interesting and fruitful interactions was with our health education unit. We also invited a lot of staff services in planning and evaluating programs that the Medical Department carried out in prevention. In other words, many of these programs were carried out by the

clinicians and the nurses who were delivering care. We developed programs that incorporated the preventive aspect, and they became responsible for carrying those out. We had to do a lot of training.

Hicke: Training the staff or the doctors?

Handschin: Training the people who were going to be delivering it, because they had not been trained necessarily with an emphasis on preventive aspects.

Hicke: I suppose the idea is you've got the patient here, you should take advantage of it.

Handschin: That's right. And many of them were having to come in from Al-Hasa--more than forty miles away. So as long as they were there, make the best of it.

Maternal and Child Health

Handschin: Much of that effort came from a maternal and child health physician whom we recruited, Hazel Blair. She'd previously worked in Iran and Alaska. We also did recruit a public health nurse consultant, who had experience also in Iran, Egypt, South America, and China working with the World Health Organization and other organizations. These people initiated an investigation as to what could be the problems in maternal and child health. It was obvious that there were lots of problems.

Hicke: Do I assume that if you have the names of these people, you will pass them along?

Handschin: The names?

Hicke: Yes, like the public health consultant. In other words, instead of me stopping to ask if you know the person's name, you tell me the name.

Handschin: Oh, well, one of the names is Hazel Blair.

Hicke: Yes, she was a doctor.

Handschin: A doctor. And the nurse was Ms. Pitcherella. Pitcher--spelled even with a "T" I think--and "ella." Pitcherella. "J" was her initial. J. Pitcherella. Jeanette, actually, come to think of it. We always called her "J"; she became our babysitter, and

she subsequently went to work in Alaska with an Eskimo group after she left Aramco, and would come down here and visit us. I saw her in about '93. Yes, in '93, I went to back to my University of Rochester for the fortieth-year reunion of my class. I graduated in '53, went back in '93. We made a special trip to go down and visit her in New Jersey and boy, we were glad to do so. She was in fair health then, but two months later she was dead.

These were really skilled people. They used English-speaking Saudi girls in addition. We had a few senior staff Saudis, who were upper echelon people, who lived in senior staff camp amongst Americans and whose daughters attended senior staff schools and were fluent in both English and Arabic. We used several of those girls to assist in these investigative efforts.

Hicke: They went along when you would go out to the villages, is that what you're talking about?

Handschin: Yes, yes. They assisted us with visits to homes, talking with parents in particular, revealing the foodstuffs and their availability; the methods of growing those foodstuffs; how they were marketed; how foods were prepared; what foods were acceptable and what foods weren't; and actual nutritional analysis of some of those foods.

Hicke: You went into all that?

Handschin: This was the basis that took some time to discover, because malnutrition was a major problem. It took some time to discover what was going on, what were the resources to combat it, and what were the cultural views about the feeding of children. There was a malnutrition problem principally in the first few years of life

Hicke: I have to interrupt you again. Are we talking now mainly about Aramco dependents?

Handschin: Yes we are, yes we are. We talked about how conception occurred, what people felt about pregnancy, how they acted during pregnancy, about delivery, and about childcare. There was actually a lot of frank malnutrition, including quashiorkor, a classical disease of protein deficiency in which female infants were never breast-fed. The male infant wasn't always taken off the breast when the second child or the subsequent child was born, particularly if the second child was a girl. And the woman might not increase her food intake. These youngsters suffered frank malnutrition as a result.

Hicke: I've seen some slides of a couple of those kids. Awful!

Handschin: One thing that came from these studies was the real cause of the problem. Adequate amounts of suitable foods were available to most families; there an was adequate amount of protein, either from meat or fish or from cheeses or from lentils. But it was not considered appropriate to feed these to children until they were three or four years old. And so as a result, we found later even if you encouraged people to use these foods and feed a child who was six months, ten, twelve, fifteen months, feed these foods, if the child once rejected it, the mother would say, "I told you so!" And so it took an awful lot of convincing the people that this was a desirable thing to feed these infants foods, particularly protein foods sufficiently. It was actually malnutrition in the midst of plenty.

Hicke: That's amazing.

Handschin: And it was all based upon cultural beliefs that these were not good foods for children.

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Handschin: Although actual frank starvation was probably pretty much--

Hicke: Are you saying "frank"?

Handschin: Yes, meaning true. The problem is that you can't sometimes tell the difference between starvation per se or malnutrition. Why did some people die? It was usually malnutrition with superimposed diarrhea on top of it. They were really very vulnerable to any infection because of the malnutrition, including pneumonia. It was an admixture. Incidentally, it's not so unique to Saudi Arabia. I find that I had two uncles in 1875 who probably died of malnutrition in Wisconsin--people trying to make a living on cut-over land that was inappropriate for farming purposes at the time, and unable to keep their kids healthy. As one uncle said, they probably really starved to death. He said that they were just were skin and bones when they were sick. It's exactly what was happening in Saudi Arabia.

Hicke: Except that they had the food available in Saudi Arabia--didn't know how to get it to the kids.

Handschin: What was lacking was suitable child-rearing techniques.

Hicke: Yes. Interesting. That's an amazing story.

Handschin: There was a really massive gathering of data by these people, then some testing of hypotheses, and then the beginning of training of some nurses and some physicians to start to teach what should be given to people whom they were seeing now as patients, what should be done.

Several different approaches were tried, and they didn't all work. Then ultimately, a fairly well-designed program was beginning to gel during my days, and it was mainly addressing malnutrition more than anything else. That was the basic thing that was causing the highest infant mortality rate.

Hicke: Is this the maternal and child care program we're talking about?

Handschin: This is the maternal and child health program.

Hicke: That is interesting, because I would have thought that just from the name of it that it was teaching mothers how to take care of their babies and that sort of thing. But it was considerably more than that.

Handschin: Well, this is taking care of their babies.

Hicke: Well, yes, that's true--but not just changing diapers and so forth.

Health Education Program

Handschin: Associated with that, I'd like to say some things about the health education program.

Hicke: Yes, I wanted to ask you about that.

Handschin: It was principally under the direction of Mitchell Owens, a very fine health educator who devised most of this. He did a whole variety of things; I can't remember all the things he did, but let me cite some of them. First of all, he--with the assistance of crews that were brought from the U.S.--did a series of color movies on trachoma, on malaria, on community sanitation, on personal hygiene. These also were shown on television. They had the television station there that had allegedly as many as three hundred thousand viewers, but I don't believe that. But there were an amazing number of people who did have access to television.

These were also shown in the public schools. Aramco had a program of building public schools, and in the end I think they built seventy public schools. In those public schools, and in others, we had a program in which our health education people went into those schools. They were fluent in Arabic. They were Middle Eastern, predominantly Jordanian and Lebanese. They carried these movies into the schools; they carried a great number of pamphlets into the schools. Later, September of 1960, into girls schools--no girls schools before that.

We even developed a curriculum for the teachers--to assist the teachers in this, including books that were specially designed and produced addressing the problems of health in Saudi Arabia. These books were then produced and given to the students at a particular level, I can't remember which. I think it was the equivalent of the sixth grade when the youngsters would leave that elementary school. They could keep this and take it home. It was a nicely bound, hardcover book with illustrations, and with illustrations that were specifically designed to be compatible with Saudi lifestyles in a just beautifully done piece of work.

Hicke: Was that done at Aramco?

Handschin: It was done by Mitchell Owens and his people. The graphics and so forth were farmed out. It was very well done. In addition then, they conducted family health classes. These were done out in the villages. There they used some of the Saudi girls who were from senior staff families. There was a weekly TV program on health; I think it was about fifteen minutes. It was pretty popular, with an opportunity to write in--that was before the days of call in--to suggest questions or what you didn't understand and so forth.

Hicke: This was Mitchell again?

Handschin: This was all Mitchell, but he had a lot of skillful people--including a number of American wives who had particular skills, some of whom had worked in television and so forth. So they were very useful too. Actually, the attempt was to really develop a willingness among Saudis to both accept and then to maintain health care, to utilize it, to recognize when they should utilize it, to understand that health care also involved washing your hands and a variety of lifestyle changes, and try to get them to maintain the things they learned from health care.

Hicke: Let me interrupt again. Change is difficult for people.

Handschin: Oh yes.

Hicke: How did they manage to persuade these people to change their lifestyle?

Handschin: Well, we'll talk about that some later on, when I discuss directing the Medical Department; we'll talk about how they had to do that for women who were coming in.

Hicke: Okay. That would be fine.

Trachoma Research

Handschin: There are a couple of other things as well while I was an epidemiologist. You had asked something about description of research carried out while I was the chief of Preventive Medicine. I might just take this time to talk about the trachoma research, which regularly was not directly under my purview as I was chief of Preventive Medicine; but subsequently when I was medical director, Roger reported to me.

Aramco donated over a million dollars for trachoma research, which was started in 1954 under Dr. Snyder--John Snyder, J.C. Snyder--who was dean of the Harvard School of Public Health. Much of the research was carried on in Saudi Arabia, but elsewhere too; they traveled to observe trachoma elsewhere. And quite a bit of work was done in Boston in the laboratory there for over ten years, including isolating the organism; developing tests to type the organism and identify it; and some attempt at developing a vaccine, which did not prove successful. Ninety-five percent of Saudi Arab employees showed evidence that they'd been infected with trachoma, and although many recovered without major difficulties, it was at that time the leading cause of blindness in the world. So there was considerable effort in trying to do something about it.

Malaria Research

Handschin: Another aspect of research that was going on was the malaria survey, which I indicated was done annually in a variety of different villages; and then I already mentioned we examined all the children in the village, particularly those who were

under two or three years of age, who were likely to be able to tell us [through the examination] what has happened in the last year or two by the fact of whether they were infected or not. We shared all this information with the Ministry of Health. We did a lot of research work on the resistance of mosquitoes to insecticides. And as a matter of fact, at that time there was a resistance developing, and we assisted the Ministry in identifying the one particular insecticide that was no longer being satisfactory in suppressing the mosquitoes, and assisted in choosing some others. Research was being applied almost immediately in continuation of malaria control. Malaria was not really eradicated, but it was very effectively being controlled during this particular period in time. I'll talk a little more about that when I talk about the impact of preventive medicine on overpopulation.

Occupational Health Program

Handschin: We did at that time also hire an occupational health physician. He principally worked along with an industrial hygienist on some of the noncommunicable disease exposures that our people had. Heat exposure was a big problem in Saudi Arabia.

Hicke: I can believe it.

Handschin: Particularly, for example, working offshore. We had drilling rigs that were located offshore. The humidity was tremendous. Those people worked forty-five minutes, and then they had a fifteen minute break in a cooler atmosphere. Changes in this pattern--when breaks should be given, and how frequently--were developed on the basis of some recommendations that came from our occupational health physician.

Hicke: Do you recall his name?

Handschin: Paul Mossman.

We also had problems on noise exposure, because a lot of activities are in noisy refineries. So we had a hearing conservation program, in which people were tested in certain strategic areas where it was likely that they would have diminution of hearing. Altering the work situation to provide baffles for sound or to obtain a variety of ways of ameliorating the risk was done through this program.

We had a lot of problems with back injuries, so we were trying to teach people how to lift and also how to organize work so that the back injuries were not likely to become a consequence. So our occupational health people had a lot of work to address, and it was one of the areas in which I gave very little supervision; these people were professionals in their own right, and mostly what they needed from me was assistance in equipment or assistance in arranging contacts and so forth. They were very good independent workers.

Statistical Data on the Impact of the Preventive Medicine Program

Handschin: You asked on the outline at the end of the chief of Preventive Medicine section something about the impact of preventive medicine programs on the local population. Let me cite some data that I gathered out of looking at some notes.

Hicke: Oh, that would be great.

Handschin: Formerly, there had been thousands of malaria cases treated annually. For example, in 1947 there were 12,000 visits to clinics by employees for malaria--and a total of 30,000 visits altogether--but 12,000 of them were among the employees.

Hicke: That's impressive.

Handschin: Ninety to ninety-five percent of children had malaria. One quarter of the employees had at least one attack a year. Now by 1963, there were less than a dozen cases of malaria acquired in the Eastern Province among our employees. That's a marked difference: from one quarter of the employees having at least attack a year down to a dozen cases a year, which had been acquired in the Eastern Province.

We had a program, starting in 1958, in which Saudi women were selectively interviewed as they were coming through clinic at the time of Ramadan. Ramadan, the fast and feast month of the year, is well remembered by people, so that they always knew events as what had happened before or after the last Ramadan. So at Ramadan each year, we interviewed women as to: "Have you given birth to a child since Ramadan?" "Is that child surviving?" "When did that child die?" From this type of interviewing--it's very simple, two or three or four questions is all it took--we were able to find out that in 1958 one out of four children died within the first year of life.

From one Ramadan to the next, one of out four children in their first year of life died: 250 out of 1,000. That was 1958. By 1966, which was only eight years later, it was down to 30 out of 1,000 instead of 250 out of 1,000. At that time, the infant death rate in the U.S., death in the first year of life, was twenty-one; and by 1966 in this group of Saudi women who had been exposed, we were down to thirty.

Hicke: Are you going to tell me what that's attributable to?

Handschin: It was attributable to the MCH [maternal and child health] program that Hazel Blair headed up.

Hicke: Mainly overcoming that malnutrition?

Handschin: Malnutrition and other aspects of child care too.

During the seven-year period from 1960 to 1967, there were no employee deaths due to tuberculosis, pneumonia, malaria, smallpox, infectious hepatitis, typhoid, or any viruses. These were all diseases which in the early days were causes of death. And that was a seven-year period in which among those one, two, three, four, five, six, seven diseases which had been common causes of death in the forties and fifties among our employees. There were none in that period.

Hicke: What a story!

Handschin: In the 1940-50 period, all of these were prominent causes of death. Comparing 1960-67 with the 1940-49 period, there was a 98 percent reduction in the communicable disease deaths, and a 53 percent reduction in accidental death. I mean, these are rates per thousand. Part of this related to other things, such as company housing, which was not just housing for bachelors or in bachelor-type quarters, but also in town sites adjacent to the major installations. These were little villages which the company built. All of these had running water in each house; running water is a great godsend. Soap and water can do a great deal in controlling disease. It doesn't even have to be high-quality water; it can be just water, because it gets used. All these had excellent sewage disposal; they had fly control; they had vermin control. All of these were developed by our preventive medicine group, who worked with those town sites to make sure that they had-- Well, that gives you some idea of the impact that was going on. Maybe I'll have some more later.

Hicke: When I talked to Bill Taylor and I told him that I was going to be interviewing you, he said during your time there was a

spectacular change in public health. You just indicated that. It really was an incredible improvement.

Handschin: Yes, it certainly was. Well, let's go onward.

V MEDICAL DIRECTOR, 1964-1968

Outpatient Clinics: Statistics on Patients

Hicke: In 1964, you became medical director.

Handschin: [reading outline] "Developing procedures for outpatient clinics."

Hicke: I understand that was one of the things that you did.

Handschin: A large part of this was related to maternal and child health. Let me give you some figures, then. During that time when I became medical director, we were caring for about 69,000 people. Thirteen thousand of them were employees. That constituted 19 percent of our people for whom we were responsible. Wives accounted for an additional 16 percent. Children accounted for 59 percent of the people we were responsible for. And the Saudi Arab parents, for whom we became responsible, accounted for 6 percent of the people that we had to care for.

Hicke: Employees' parents?

Handschin: Saudi Arab employees' parents.

About 92 percent of our population that we were covering were Saudi Arabs, 6 percent were American at that time, and 2 percent were of every other nationality. That 2 percent was low because they didn't have their families; they weren't permitted and we didn't care for them. In 1968, which was towards the end of my tenure, one out of thirteen people in Aramco worked in the Medical Department.

Hicke: One out of thirteen?

Handschin: That would be about 7 percent, something like that--and we used 6 percent of the company's total operating cost. And about 12 percent of our Medical Department costs were for prevention: about a million dollars a year was being spent on prevention at that time.

The principal cause of severe, serious illness in children was the malnutrition-diarrhea complex. It was the biggest single health problem. And it was through the developed procedures that Hazel Blair and Jeanette Pitcherella spent so much time writing procedures for outpatient clinics. They'd plan these preventive aspects, then they'd teach them to the people who were going to utilize the techniques. There were other things that were being done in addition to preventing malnutrition. For instance, we had problems with tetanus in the newborn--children being born and the umbilical cord wasn't handled properly. Most of these people were being delivered by midwives in the village. But they weren't really midwives; they weren't trained midwives.

Hicke: Just an older woman?

Handschin: They were casual cronies who did this. And we had a lot of trouble with tetanus in younger children. So one program for the prevention of this was to immunize women, even before they became pregnant, you see. And their antibodies went through the placenta and protected the child. We also developed--because of considerable need--a program of giving BCG, which is a tuberculosis vaccine, to newborn infants.

In the clinics we developed some day-care units in the clinic, right adjacent to where the curative medicine was being practiced. The mother could be sent by the doctor or nurse to stay in that unit for eight hours to receive education that seemed to be appropriate for her particular problem. For instance, the mothers would prepare the food for the child there, and they would feed the child under the tutelage of the nurse. And not only once, but repetitively, so that in an eight-hour time period, they would feed the child maybe three or four times. Each time, that activity would be critiqued. A lot of this was group instruction. There'd be ten or twelve or fifteen mothers there in that particular room, and there'd be an interaction in that group--maybe not with neighbors, but with people they could talk quite freely to because they were the same clans.

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Handschin: During those all-day sessions they also got new information. I have emphasized food preparation, but there was also emphasis on skin care--because you had a lot of problems with skin infections--also upon the whole care of an ill child: how to respond to minor ones and those that required more care.

Hicke: When to see the doctor.

Handschin: Yes, that's right.

Hicke: That's the hard one.

Handschin: But in our case it often was when to see the nurse, too. We trained nurses for screening. We had no Saudi Arab females available. We used predominantly Middle Eastern female nurses, Indians doing the more clinical, the more routine aspects of care. But most of these people active in the actual on-the-job training were Palestinian, Jordanian, some Egyptian. We had an English gal who spoke Arabic pretty well too. These were all trained in Aramco by our MCH nurse and our MCH physician, which was really a major thing to do that.

Developing Public and Private Medical Services

Handschin: Another aspect that we really had to do as a medical department was assisting in the development of public and private medical services in Aramco--non-Aramco services--and to some extent allocating some medical service to the general public where it wasn't possible for the public to get that kind of service. We helped establish the first hospital in al-Khobar--a town of about 35,000. I'm suddenly blanking on the name of it. It was a private hospital. Al-Sharq was the second hospital in this same area. But when this first one was established, we provided initially 90 percent of their patients. They were Saudi employees and Saudi dependents, principally Saudi dependents, I should say. They had on their staff twelve well-trained, non-American physicians, some of whom had been trained in America. It was a large, well-run hospital. They had, for instance, a center for preemies that was the equivalent of what was available in many parts of America.

Hicke: That's wonderful.

Handschin: We had assisted in the establishment of the second hospital; about 85 percent of its patients were Aramco.

Hicke: These are contract hospitals, right?

Handschin: These are the contract hospitals. In both of these hospitals, Aramco supervised and audited their care. We had Dick Perrine, who was in charge of this, the liaison physician. Almost every aspect of their medical and nursing care was audited and reviewed to see how it was going. The general public was free to use these; initially, of course, it was only the more affluent ones and expatriate personnel. There were many expatriates in the area who were attracted because of the opportunity for economic endeavor supporting Aramco, selling things to Aramco.

Hicke: Are you talking about American expatriates or all kinds?

Handschin: Not necessarily. There were Indians, English, Germans, French, Americans and so forth, a great variety. These hospitals provided a resource for that group of people too, including those who had brought their families along.

In addition, between 1963 and 1966, a four-year period of time there, we paid about a \$135,000 a year to a team of consultants from the World Health Organization to assist the government in developing the health services for about 360,000 people in the population who were not Aramco employees and who needed care--in particular, to work on one hospital which had been sitting idle for five years unutilized, and to get that going; and they did. They were able to get that hospital open; and although the care was far from what we would like, it was there.

In the year before we started that program with WHO advising and expediting, the year before that we provided \$1.1 million in care to the general public in '62. In '66, four or five years later, \$400,000 only--a significant reduction. Of course, we had expended \$400,000 providing the advisory assistance for that. Later, Aramco expended at least \$700,000 in total to the World Health Organization. I have no data, but I know that there was continued progress.

Relationships with Company Management

Handschin: You want some things about my relationship with company officers and reporting procedures. I reported as medical director to the vice president of Industrial Relations. Sometimes they had a slightly different title than that, but

basically that was it. In some instances, I used to relieve Dick Daggy when he was on long vacation. I served under several different vice presidents of Industrial Relations, including two who ultimately became presidents of the company; so they were quality people.

Hicke: Who were some of these people?

Handschin: [Bob] Brougham was one, and Liston Hills another. I guess that what had happened was that Dick Daggy had established a remarkably good relationship with company management--because I just fell into it and found that our relationship was always one of cordiality. I was at ease. I was usually able to get what I wanted. I found that the transmission of information upward to them about our needs, our successes, or our failures was really an enjoyable activity. I enjoyed that aspect of my work more than maybe many others. I also enjoyed defending the department against some budget cuts, and I think I was largely successful in those interactions.

For instance, I felt that I was given a lot of respect, and I had a lot of respect for these people. All that had been prepared by the type of interaction that Dick Daggy had established. I just lucked out.

Hicke: Well, I'm sure you had some input also. That sounds like a very good working relationship and one of the reasons you were able to do so much for them.

Handschin: And there was a keen understanding of what we were doing in the way of preventive care at the highest level, including Tom Barger, who was at that time the chief executive officer. Barger had a thorough understanding. Barger would come down and go with people like Dick Perrine and me. I remember one time the three of us went to visit because he was interested in these private hospitals, the contract hospitals. He came down and said, "Let's go visit." It was really unannounced. He said, "I just thought of it today," and very informally came down. Perrine was there, and the three of us hopped into Dick Perrine's little Volkswagen.

And Barger was a tall man too. We had called ahead to tell them that we were coming. The first hospital we were visiting was headed by a Palestinian, who had spent a lot of time in the U.S., incidentally. He was a physician. And he was very surprised to see the chief executive officer crawl out of the back end of a Volkswagen! [laughs]

- Hicke: The two of you unfolding yourselves! That's a good anecdote. It illustrates how things got done.
- Handschin: It was really a very egalitarian community; people had very little pretense. Barger especially was a very admirable man, very admirable.
- Hicke: Yes, I understand from what I've heard about him that he certainly was responsible for much of the interest in the Saudi culture.
- Handschin: He was. He was a student of the Arab people and the Arab culture, and an appreciator of that. As a result, he was admired by the Arabs, who recognized the empathy he had.

Hiring and Educating Staff

- Handschin: [reading] "Talk about recruiting and hiring." I did very little of this, actually. Largely the recruiting and the hiring of staff were done by people directly under me. They had the savvy to know what kind of people they wanted. They reviewed them with me, but I did very little. When I was chief of Preventive Medicine I did do some hiring. I helped hire Hazel Blair and Jeanette Pitcherella. I hired the epidemiologist, Ivan Alio. I recruited him directly. I was responsible for the recruitment of Gordon Flom. I don't think I've ever met him. But I was working with some people from Booze, Allen, Hamilton who had provided a variety of names, and I recognized that this man probably had the most suitable background among the many candidates. But I've never met him, that I recall. I say that, maybe incorrectly, because I find that I've often forgotten people whom I've actually met.

[reading outline] Let's see what else I have. I'm about ready to move to the second page here. "Ongoing education of staff." Well, one thing, of course, I've already described something about the re-education we had to do among clinical people who were predominantly curative in their viewpoint. That involved a lot of education, of "Hey, it's really important that you report communicable disease." But it's also much more elaborate than such things as that. It's "In your preventive practices, you are going to be held responsible."

- Hicke: This was a new approach, right?

Handschin: That was a new approach. It was not accepted by everyone. There was quite a difficulty. We didn't win all the battles, but we were most successful probably in the area of tuberculosis control, where we had a tuberculosis control physician who really believed in prevention. Another area was the whole area of maternal and child health. We did pretty well there, in the long run. Then, ongoing education of staff: we had a whole program at Aramco--I forget its title--it was management and professional development, in which we had a plan for every key person as to what they might benefit from in the way of additional training, and when it might be. That training could be on the job training, for instance, to rotate them through different assignments. I was medical director--as vacation relief--for two months or two and a half months, I would be assigned to Ras Tanura and would run the Ras Tanura medical center or Abqaiq.

So similarly, we did this for everybody. This could be on the job training or it could be educational leave, or it could be sending somebody to a year at school, which we did, for a master's in public health. David Weeks, who became chief of Preventive Medicine--we sent him off for a year of public health training at Harvard. I was sent for training in executive management at Columbia University's campus at Arden House in urban New York--six weeks of rubbing shoulders with executives from IBM and a variety of other people. There was a whole program, and this was reviewed annually, not only with the personnel department--to make sure that you had this--but you had to review it also with your boss, all the key people underneath you, and so it went. Then if we felt that people were weak at particular management skills, then we gave them a short course that might be available in the field or actually have them spend some time substituting for somebody. So you got an idea of what it was: "Hey, you're just objecting to all this; somebody is going to be gone a month, why don't you fill in?"

Hicke: See how it looks from the other side.

Handschin: So, I spent a lot of time on some of these programs, assisting and advising on how surgeons should be upgraded, the new Saudi surgeons we had brought on.

You asked about Tapline outposts. We didn't figure that much with Tapline. We backed them up occasionally on medical care. They had pretty much their own outlet. We brought some of their medical people down and gave them some indoctrination in some of the things that we had learned, but they were people

that had been trained at American University in Beirut largely. They were pretty capable on their own.

Dr. Ivan Alio

Hicke: How about the U.S. military? Did you have much interaction with them?

Handschin: I didn't have any, although I recruited my successor as epidemiologist, Ivan Alio, there. Most interesting guy. He was a Macedonian, and when part of Macedonia was taken over by Greece, his father moved to Sophia. And so he, who had spoken Macedonian as a child, grew up in Sophia, Bulgaria, spoke Bulgarian. But he took French too, because his father had been educated in a French medical school; so he took French and ultimately he was going to go off to France. Just about that time, the war came and Bulgaria was on the other side; so he went off to Germany and went to medical school in Germany and learned German.

So a Greek-Macedonian-Bulgarian-French-German-speaking Ivan went through medical school.

Hicke: And eventually he must have learned English.

Handschin: Well, not yet.

Then he went back to Bulgaria. But he didn't like it; it was after the war was over and he didn't like it. He made plans to get out, and he was able to go on leave to Prague, and he got into Prague just as it was falling to the Russians after the war. He skipped out of there in a hurry and he got to Italy.

In Italy he was in a refugee camp, and he served in this refugee camp as a physician. He started to learn Italian, quite a bit of Italian. He was there for a long period of time, and he wanted to get to America. So he started doing research in what kind of things could he become skilled in to emigrate. He found out the list of things that were in demand in the Americas, and one of them was a skill in, as I recall, textiles--re-dyeing of textiles and production of textile products. So he did research in Italian in the local libraries that were available on this, and he was able to pass the test proving that he would be competent to assist in the development of some kind of textiles. And as a result, he had an

opportunity to go to either Peru or Bolivia. I forget which. I think it was Peru, but I'm not certain. When he found that out, he started studying Spanish. He said that he got off the plane in Peru, Ecuador, Bolivia--I forget which--and he said by the first night he had a date with a girl, and he could carry on a conversation in Spanish that was passable.

Subsequently he migrated to Venezuela, where he served under a world-famous malariologist. He trained under and served under this fellow on malaria control in the upper reaches of Venezuela, a really primitive area. But his mentor told him if he really wanted to get ahead, then he ought to train in the United States and encouraged him to make an application to the school that he had attended: Johns Hopkins [University]. And lo and behold, he was accepted at Hopkins, even though he wasn't fluent yet in English. But he had started.

He was accepted and went to Johns Hopkins and learned English. He met a girl there who became his wife. She was employed at Hopkins, in clerical or secretarial, and she did a lot of tutoring. He went through and got a Master of Public Health at Hopkins.

Hicke: What an amazing story!

Handschin: Then, in order to expedite his American citizenship, he joined the [U.S.] Army and served in Korea, where he was an advisor in preventive medicine to the Korean armed forces. And he learned a good deal of Korean! He just had this innate facility for learning a language very rapidly. I think he was in Korea two or three years, then came back and was about ready to be discharged when he saw our ad for an epidemiologist. I interviewed him at Fort Leonard Wood in Missouri on a vacation. So that was one person that I was actually responsible for recruiting. I brought him out to Saudi Arabia. He was an avid student of Arabic, and it wasn't long before he was quite capable in Arabic.

He was also in the military reserve; the military was using him to provide information about health conditions in Saudi Arabia. He did an enormous amount of traveling in Saudi Arabia for the benefit of Aramco and for the benefit of the American military, describing living conditions and health conditions, occurrence of disease, and availability of medical facilities--describing the health infrastructure of the country for us and for the American military. So that's the only instance I can talk of in which I know of direct interaction with the military.

Hicke: Oh, but that was a wonderful little history of Dr. Alio!

Handschin: Oh, he was a very interesting guy. He had some rough edges, but he was a guy who was most intriguing to listen to. Later he went back and visited in his old country, and brought out a priceless icon from Bulgaria that had been in his family for several generations. His mother was still there. But he had covered his tracks well. He had arranged that everything was in order as he left there, and he left nobody dangling up in the air.

Hicke: That was wonderful.

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Hicke: You were just going to tell me what happened to him later.

Handschin: After he left Aramco Ivan Alio became medical director for the Peace Corps, a position which he held through at least six or eight years. He was the medical director for the Peace Corps and was, once again, active traveling. He was a most inquisitive and acquisitive guy: he wanted to know things and facts.

Hicke: I'm glad to hear so much about him.

Lecturing at the American University of Beirut

Handschin: You ask about lectures at AUB. Actually, I made very few. Principally they consisted of descriptions of Aramco's programs; descriptions of the health conditions observed in Saudi Arabia; descriptions of our nurses, many of whom had been trained at AUB; sanitary technicians, how those people were being used in Saudi Arabia; what they had learned at AUB that was of help and things they had to learn additionally that hadn't been provided at AUB; and how physicians--we used an awful lot of American University of Beirut physicians--how they had been utilized and how they had opportunities for advancement and so forth. So those lectures at AUB were principally in the School of Public Health, although I think I gave one or two to the School of Medicine. But I was not on the School of Medicine Faculty; I was on as a lecturer in the School of Public Health.

More Statistical Data About Changes

Handschin: [reading] "Something about changes that I observed during my time in Arabia."

Hicke: Enormous, for one thing--

Handschin: Yes.

Hicke: --the changes that you effected while you were there. But-- other things.

Handschin: In 1952, six years before my time, there were three non-Aramco physicians in the Eastern Province, at a population then probably close to 300,000. In 1967, fifteen years later, there were ninety-two employed by the Saudi Arab government. In fifteen years they'd gone from three to ninety-two. By that time, they were located in twenty-four different towns, and there were at least nine different specialties that were represented among those things.

Nearly all of those Saudi Arab government physicians also were practicing part-time as private physicians. That's what attracted them: most of their income was in the private practice. So half-time, half-time. Or, a full-time position with the government--which was about a six-hour day--and then six hours of practice in the evening in their private clinic.

Hicke: Some of these were at the contract hospitals, right?

Handschin: Some--well, no. We'll go on to those.

Hicke: Okay, go ahead.

Handschin: Then in addition to those ninety-two who were employed by the government, there were sixty who were solely in private practice. They were located in only six towns, the larger towns, including al-Khobar, as an example. There were also at least nine specialties represented. So you add these up-- you're talking about the non-Aramco physicians: 152, fifteen years later from the time there were only three.

And if you add in the Aramco physicians, there was a total of sixty-five doctors per thousand in Eastern Province. Compare that to Alaska: at that time, there were seventy-one per hundred thousand. So sixty-five in Saudi Arabia, seventy-one in Alaska. Seventy-four in Mississippi in 1965. I'm not talking about the quality necessarily of all these physicians

or how they practice, but obviously an enormous explosion in fifteen years. You might talk about evolution; actually, it was almost revolution. And this continued on after that time. So those are some examples of the changes.

I've got some more statistics, but I'm going to run into them later.

Hicke: Do you want to say something about why and how this enormous explosion took place?

Handschin: We were giving a good deal of advice to the Ministry of Health in trying to get them to hire more physicians, more nurses in particular. But mostly it was economic opportunity that attracted doctors. There was money to be made, and that's why these people flocked in--to take advantage of it. It was the arrival of all these expatriates in particular: a large number of Palestinians, Indians, and others who came there had been accustomed to good health care.

Hicke: You were talking about the supply; now you're talking about the demand side.

Handschin: So the demand side was there. And these people had money and they could pay for the care; many of them had wives and children, and they did pay for that care.

Crucial Leadership of Dr. Richard Daggy

Handschin: One thing I want to talk about is something about the leadership by Dick Daggy, first as chief of Preventive Medicine and then as medical director. He's the guy who recruited me as an epidemiologist. He assisted in the recruitment of industrial hygienist, maternal and child health physician, and the nurse consultant. I actually recruited the occupational health physician. He established the first disease reporting system. It wasn't perfect. He did a lot of special studies of particular disease.

He was the person who instituted malarial control. He is the author of the definitive study of malaria in oases, a published document. There were many springs in the oases, from some of which water then flowed down canals. He introduced a particular kind of fish that would eat the *Anopheles* mosquitoes' larvae as a malaria control mechanism. He turned that malaria control pretty well over to the

government by '54. I think he was hired in '48. In six years, he did an enormous job of malaria control.

He's the one who devised the idea that all these preventive medicine people that he was bringing in should be staff advisors to line operators. They should do the studying, the planning; they should help expedite; they should evaluate; but they should not directly operate most of the preventive programs that were related to clinical care. Instead, the curative doctors and nurses were made responsible for the preventive programs in their own clinics, and they had to be given in-service training that people had recognized as necessary for preventive aspects. And not all clinicians really relished this new role.

Hicke: Yes. And this was all devised by Dick Daggy?

Handschin: It is a tribute to Daggy.

During '61 to '66 there was increasing recognition that one clinic should serve to provide both the preventive and the curative care. In one site--not a separate site. And then to make every clinic visit an opportunity to review what preventive means there might be, and how to address them--and how to dispense a pound of prevention with a pound of cure. So there was widespread recognition that this was the way to go. Daggy's concept was resisted by a certain segment of people who were in curative medicine at the time. But ultimately the people who started seeing it pay off fell in and found out "Hey, this makes sense." That, I think, was his creation; all I did was fit into the traces when he fell out and try to jog along the same sort of way.

There was really a very heavy emphasis upon primary prevention: preventing from occurring if possible. Then the second step: early diagnosis. If it has occurred, let's find it and do something about it, actually to treat it, and if at all possible, in an outpatient setting--where the patient is still standing. We provided 450,00 clinic visits a year; 50 percent of our medical care costs were outpatient care. We attempted to provide those outpatient physicians not only suitable time to see the patients, but suitable supporting personnel, the lab, an x-ray, the requirements that they needed.

Principally this kind of care was under the direction of general practitioners, but we provided suitable speciality care to try and keep people out of a hospital. Because hospitalized patients, in addition to their medical care had all the expense

of room and board: the equivalent of being in a first-class hotel, the expense part. So it was an emphasis also in Aramco --and this again came from Daggy--on using the lowest level of skill which can competently do the job. And if that lower level of skill is inadequate, we give them specialized training or on-the-job training to upgrade it to a particular level that we were comfortable with. Forty percent of outpatient visits were attended solely by an appropriately trained nurse. Forty percent. Nurses outnumbered doctors in the clinic four or five to one, and they provided 75 percent of the care, mostly under M.D. or under nursing supervision. So an enormous amount of care was being done by nurses.

Hicke: Weren't you ahead of this trend in that?

Handschin: Oh, much, much more so. Way ahead. Ahead of what we were doing in the United States too. And again, these are Daggy's ideas that I believed in, and others did too. But he was the leading proponent and he was the guy who sold it to management. Management liked it too, because an estimated 20 to 30 percent of our care was preventive care that was being delivered by these nurses. Nurses were closer socioeconomically to the patient than the physicians were. They could relate better to the patients. And most particularly the nurses that we were hiring cost from one-fifth to one-tenth what physicians cost.

Now how did the GPs interact in these large clinics that were working with the dependent? GPs worked two days a week in a screening modality in which they were working with several nurses at their elbows. They quickly screened patients, and determined what should be done for them that day--to whom they should be referred. They would see maybe a hundred patients in eight hours doing that. But they had only to say, "Nurse, do this for this patient." And many of those patients got referred to another doctor that day, immediately sometimes.

This was triage; this was sorting to determine what are the skills that we have that should be applied to this particular case, and then the doctor and the nurse jointly making that decision. So that was a screening program. It wasn't much fun, and some guys disliked it. They would spend one to four minutes, maybe, with a patient, and then get them into the hands of a nurse who was going to do something for the patient. But then the other three days of the week, the general practitioner went back to being an attending physician. He then would see maybe fifteen patients, maybe twenty, but fifteen commonly, and give them a more complete workup. For every ten general practitioners working in a clinic, we had a senior physician who just floated around and helped. He was a

clinical leader, chosen because of his capability, assistance in diagnosing, assistance in handling and treatment, and so forth. He was in charge of the clinic, but his job was principally to serve as a consultant to these other people. He himself might see a few patients that day--the more complicated ones. But in the main, that's his focus. Again the idea being using the lowest level of skill that can competently do the job.

In fact, those clinics in the main handled about 98 percent of the outpatient care of dependents. Only about 2 percent at most ever were referred to specialists for outpatient care, although we had about twenty specialists available that we could send them to. So it was that the general practitioner became a specialist in common diseases and afflictions--in their prevention, and in their treatment. They really knew about a variety of things that they were seeing most commonly.

The Preventive Medicine staff became responsible for developing overall objectives and methods in disease prevention and control. We developed manuals for tuberculosis control: they gave some guidance as to what specific therapies were to be used, what specific screening programs were to go on, how you followed up on all contacts, how you got people to come back in when they were supposed to come back in at certain intervals, and how you related to the supervisors of these employees. All this was spelled out in considerable detail. And we had that not only for tuberculosis control, we had manuals for maternal and child health programs too, so that there was agreement between the clinic and the information that we were providing to employees through our health education program.

Aramco had a series of schools--industrial training schools. Remember, when we first started operating there, 98 percent of these people had not even attended an elementary school. There was illiteracy. We began a big literacy program. We ended up training many, many people to read and to write. In that process, we put health education into that; so we did that too. As long as you were learning to read, you could learn to read about diseases or conditions of the country, in the home and the village.

Hicke: Did you write these manuals? Or your staff?

Handschin: The staff. I assisted in critiquing many of them. We had similar manuals, for instance, for hearing conservation, and we had to have certain standardized approaches for immunization:

what immunizations should be provided; when they should be provided. Not left to the judgment of the individual physicians. He could countermand it if he had reason to. Also, how do you teach cleanliness, which was an important thing to do? How do you teach infant feeding? How do you teach care of skin? and so forth.

All of these were things that the Preventive Medicine staff spent time developing: working with the clinicians, getting their ideas; finding out what was feasible and what wasn't feasible; what would have been desirable but couldn't be achieved because it was too boring or it was too demanding; and so forth.

Hicke: Amazing.

More Data on Patient Care

Handschin: I've got some other things that I've looked up.

Hicke: Good.

Handschin: In 1957, 40 percent of dependent infants who were hospitalized in Aramco facilities died within twenty-four hours. Sixty percent died before they were discharged. That was in 1957. In 1967, ten years later, less than 10 percent died. This came about by getting people in earlier, recognizing problems and dealing with them on an outpatient basis. Between 1962 and 1967, we saw the deaths among dependent children due to pneumonia, diarrhea, and malnutrition decreased by two thirds in a five-year period of time. Deaths among children decreased by two thirds.

Hicke: That's amazing.

Handschin: I don't think we introduced any marvelous new medications or any great new procedures.

Hicke: No new drug discovery?

Handschin: It was better information on feeding, on earlier seeking of care, telling people whom to seek out, and then finding out more effective outpatient care.

Hicke: Can I just interrupt to ask you: did you feel this happening?

Handschin: Oh, definitely so.

Hicke: You could see it happening? It must have been very exciting.

Handschin: Yes, yes. That's what finally turned some people around who at first thumbed their nose at this idea. When they began to see the results, they would buy in. For instance, the big change in tetanus: I don't remember the fifties, but the frequency in which we were seeing tetanus in the newborn was just dropping. It could be attributed to a program we developed.

Hicke: Very rewarding, it must have been.

Handschin: It was.

Between 1961 and 1965, the clinic visits per hundred wives or children went up 24 percent; and that's within a six-year period. But hospital days per hundred outpatient visits went down by 24 percent. In other words, the most expensive and often the most futile type of care--hospital care--was significantly reduced; so that in a sense we began to look upon hospitalization as a failure of medical care. People shouldn't be hospitalized. They were hospitalized because they didn't receive suitable medical care, including preventive care, before then. They didn't have the proper information in order to be able to do the sort of things they were told to do. And that idea gained weight even in this country. It's just recently that you find that hospitals now, instead of being considered sort of the quintessence of care, there's now been a great recognition in this country that many of these things should not be done in the hospital; they should be done on outpatients, or patients not even admitted to the hospital but brought in as outpatients only.

Hicke: You were pioneering a philosophy of medicine, in a sense.

Handschin: Yes, yes, we were.

Hicke: That's really fascinating.

Handschin: In 1966 Aramco treated 300 cases of malaria, and only a few of those were our own people. Most of those were general public. Compared with 30,000 twenty years before. See, another example of how things changed.

In 1952 there were fifteen non-Aramco hospital beds. By 1967, which was fifteen years later, there were six private hospitals with 350 beds. In fifteen years, it's gone from fifteen beds to three hundred and fifty. Two hundred and fifty

of those beds were in two hospitals that Aramco supported by providing most of the inpatient load. But we also aided government in addition to these private hospitals, and they had 680 beds in maybe eight government hospitals. You add all those up and you came to 3.3 beds per thousand population achieved by 1967. That compared to about five beds per thousand in the U.S. at the time.

Need for Nursing Staff

Handschin: The major problems in the government hospitals at that time were a critical shortage of nurses and of able administrators. Often the administration was left in the hands of doctors, and doctors aren't necessarily good administrators.

Hicke: I think Bill Taylor told me that Aramco had the first health administrators in the Middle East.

Handschin: Yes. The biggest criticism that I could make of non-Aramco care was the shortage of nurses. What that country really needed was nurses--not doctors--more than anything else.

Hicke: But there was a resistance, I think, to training women as nurses.

Handschin: Oh yes, big resistance, yes. Probably in the long run the most significant long term health event in the country was the establishment of schools for girls in 1960. By 1967, seven years later, there were already 25,000 girls enrolled. Before that, nothing, nothing. Generally speaking, about 75 percent of medical care in the U.S. is delivered by women--nurses, doctors, and so forth--between 70 and 75 percent. Now even 50 percent of physicians, the younger graduates, are female.

So literate mothers, ultimately, are really a key to having good health--mothers who establish the family living patterns and mold those--"Wash your hands before you come to the table"--all these principles of good health and disease control. This evolves from parent education, particularly of the women who are the guardians of the next generation and establish what's going to happen. That had not happened by the time I left. These were kids in grade school. And then of course later, there must be higher education.

VI OVERVIEW: GOALS AND ACCOMPLISHMENTS

Handschin: I'm going back down to one last thing on your outline. I'm going to spend a little bit of time talking about my own experience as medical director and some of my reactions to that, with my objectives and accomplishments.

One major objective I had was that you try to create and then maintain a climate within the department that would be conducive to delivering both suitable care effectively and efficiently by a variety of professionals who themselves did most of the planning and who themselves delivered most of those services, who in large measure, by the kind of professional training they had, were accustomed to self-policing of reviewing quality of care, of being aware of other instances of poor care that they might encounter.

In some respects, little of my time was needed to maintain this aspect. It was mainly keeping people congenial, making certain they were following up on quality control, making certain they were aware that there were limits to wasteful use of certain services, and also there was waste when you failed to use other kinds of services that would be beneficial. In the main, this was a professional organization in which the professionals were running it. It wasn't quite as bad as what--who was it?--Hutchins, president at one time of [University of] Chicago, who said something about: "A university is a group of professional educators, all of whom have only in common a public utility system."

We had a lot of interaction, but mainly these people provided many of the ideas. I did spend a lot of time on that. I had a lot of difficulty and a lot of time consumed in finding people who were interested in change within that group--who were motivated--and finding those professionals who were willing to undertake some kind of creative administrative

change that would be needed to increase efficiency or effectiveness.

At best, I think that where I was most successful was in identifying some of the more accomplished professionals and helping them do their kind of job better--people who were doing an excellent job--help them do even better and help them because they were doing things that we wanted other people to do. So help them propagate their ideas, abet them, and assist them. In other words, I was getting the good people who were already doing good things to help others do the same thing better. A major portion of my time was really in assisting good people to do things better than they had been. I had ideas that there ought to be change, and these people were suggesting there were changes; so I was seeking allies who agreed with that and then working with them.

Hicke: It sounds like politics.

Handschin: It was. And I wasn't always, by any means, successful.

The second major objective I had was, of necessity in an industrial organization, to transmit and to explain company management's objectives, the company's interest, and the company's policies. To transmit this I went to communication meetings at least twice a week with top management, in which I was exposed to things that should be transmitted downward. This I did quite faithfully to maybe eight or ten division heads that I had at the time. And I thought we did a good job of that, a good first step. But I was often dismayed at the trickle. The flow stopped at a trickle. And I admitted to management that I was having trouble devising ways to enhance its percolation in greater amounts downward.

I found that the Medical Department was not unique in this; they were having problems like that throughout the organization--of getting the information spread. There were a variety of programs. They brought in a program called the Managerial Grid. In fact, I participated in it. It was run by some psychologists out of Texas, who had a very good program of getting people to open up and learn how to recognize the skills of the people they were working with, how to become team members. Very effective program, although it was frustrating to me. It wasn't much help to find out that other people were having the same problem. Important things were not getting to the proper people always.

Hicke: Do you have an example of something like that?

Handschin: Not readily. [pauses] The company often had to--sometimes with advice from the government--make some decisions that were not popular. And to be able to share those decisions explain them, and explain the rationale for making them was one of the duties I was expected to perform. I tried to do it. I enjoyed doing it. Occasionally, we had meetings in which I would address fifty or sixty top people. But mostly I dealt with someplace between eight and twelve people. It was kind of disconcerting to find that not everybody was quite that interested in doing this. It was an annoyance, and something I hadn't bargained for.

And maybe one final objective that I had was almost the opposite, and that was to transmit to management and to others in the company some things about the needs of the medical department: the capabilities, the problems the medical department was having, sometimes the successes and failures of the medical department, the people within the department, and the programs. I found this to be one of the most enjoyable things I had to do.

Hicke: It sounds as if you increased communications.

Handschin: Yes. I felt it was useful. It made me feel highly creative. I've always spent a lot of time trying to be able to articulate to people in a way they would understand why we were doing some of the things we were doing in the medical department, particularly each year.

Hicke: You had a lot of successes to report. That's one of the nice things about doing that.

Handschin: We did, we did. I was willing to really strive towards some of these. I was willing to do that, because not all clinical people would really like to spend a lot of time digging out the data on how we are controlling costs, for example, which was often an incessant question that came from management. How efficiently were we operating? Or why we were failing to be effective in training Saudi nurses? I wanted to lead a creative team, and I was really strongly motivated to do that; but I didn't think I was as effective in leading a team as I would have liked to have been.

I left Aramco because I had a son who was mildly retarded, born in Saudi Arabia. By the time he moved out of kindergarten and the first grade, he was obviously uneducable in that particular setting. He was not at an age where we could board him, so we moved back here at that time. That was a big disappointment, because I had all kinds of aspirations.

We had a group from Booze, Allen, Hamilton consultants out. I had a lot of aspirations to become a more successful person, to develop better leadership skills; and I never exercised them to the extent I hoped for. But I had a lot of fun.

I learned a lot of things; I saw a lot of things. And surprisingly, some of the things I'd left there, I came here to do, and started work here in a large cooperative that was caring for about 100,000 people. I started beating the drum for nurse midwives. Oh God! Our obstetricians here went up in smoke. What? Ultimately, it was our consumers who demanded more nurse midwives, and they got them.

Hicke: So you did some pioneering here as well.

Handschin: I did some things that they wouldn't believe in until I cited some data. And then interestingly, I used some of that data that I was acquiring here working with Group Health of Puget Sound, which was a leader many times in using physician assistants, as they were being trained. I used a lot of this data when I then went back with Roger Nichols as a consultant to the Ministry of Health.

Hicke: Oh, were you part of that corporation?

Handschin: Yes, that's right. I provided a lot of information to Roger: staffing, and so forth. There was a melding of what I had learned in Saudi Arabia with what I was learning from Group Health here. So there was some continuation. But I'm just amazed at how--if I hadn't had some notes from speeches I had to give--there were vast areas of what we were doing out there which my unprompted memory would not have brought back.

Hicke: I really appreciate your doing the research and bringing the notes. You've got it all organized so beautifully. But also, you've told me so much that I haven't heard anywhere, which is surprising because I've talked to a lot of people.

Handschin: If Dick Daggy were in his old health, I don't think anybody could talk more. He had an enormous fund of knowledge that he acquired, well thought-out. He had winnowed and sifted to find out what were the essential things. He was the architect of that system that I felt was kind of unique. We at least spent some time interacting with other oil companies and their programs. We were asked to come and talk about what we were doing with Kuwait Oil, which I think of immediately, and with the oil company in Bahrain. We spent a lesser amount of time with the Iranians, although we attended clinical meetings of the so-called Persian Gulf Medical Association, which was

principally people in the countries surrounding the Persian Gulf who were affiliated with oil companies--mostly physicians, though some weren't. There had never been any missionaries operating in Saudi Arabia; there hadn't been missionaries in Bahrain and the principalities along the Persian Gulf. But there had been no other Western practitioners of medicine, really. The first Saudi who graduated from medical school was in 1948. And shortly thereafter, there were about five or six. Unfortunately, most of those people had entered medical school directly out of high school.

And they were weak in math and science. Most of them didn't stay in the practice of medicine for long. That was the early history in the fifties. There were some outstanding Saudi physicians, including one that we helped to get a master's degree in public health at Harvard.

Hicke: Who was that?

Handschin: Dr. Zowawei. Omar Zowawei. He had a charming wife. We entertained them and they entertained us openly several times.

Hicke: That's a good note to stop on and I really appreciate, as I said, all you've done. Thanks for a big contribution.

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Aramco Medical Department Oral History Project

Julius W. Taylor

SURGEON AND MEDICAL DIRECTOR: 1954-1978

An Interview Conducted by
Carole Hicke
in 1996

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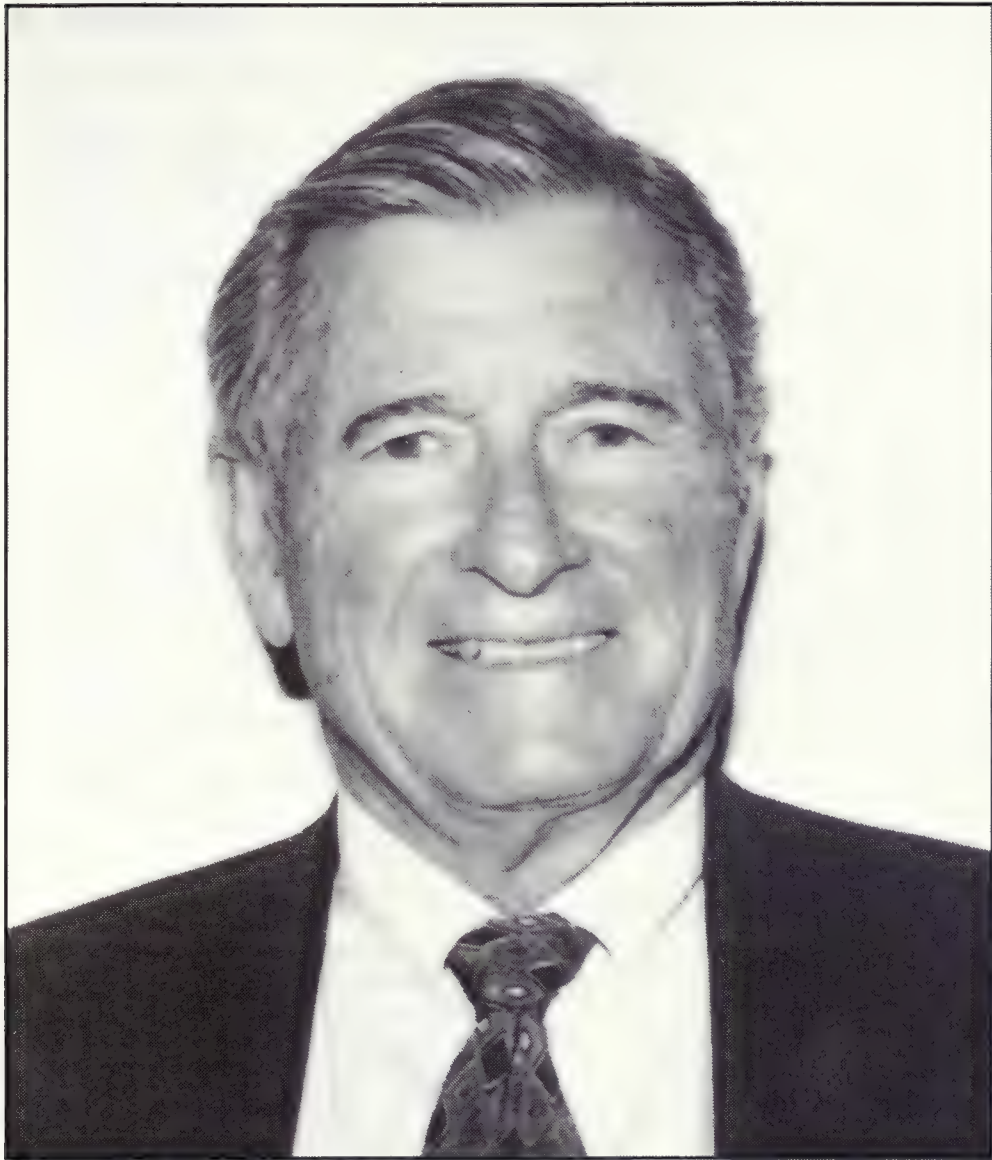
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Julius W. Taylor, July 1998.

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INTRODUCTION--Julius W. Taylor, M.D.

Dr. Taylor came to Dhahran, Saudi Arabia, in 1954, fresh out of a surgical residency training program at Kingsbridge VA hospital in New York. In Aramco's Medical Department he served as a general surgeon, then successively as chief of Surgical Services, chief of Clinical Services, and finally, as medical director. Not only is Dr. Taylor a talented surgeon, but he demonstrated, early on, a gift for organization and leadership, most effectively demonstrated during his years as medical director. But Taylor lost neither his interest in surgery nor his surgical touch as he moved up through administrative ranks. Among his other accomplishments, he published the first paper on the epidemiology of cancer in Saudi Arabia.

Bill and his wife, Lois, were very active in Dhahran community affairs, in tennis, and in gracious entertaining. They finally left Aramco in 1978, settling in New England, where Bill ultimately took on leadership of Boston University's Student Health Service as its medical director.

Armand P. Gelpi, M.D.

December 9, 1997
Sonoma, California

INTERVIEW HISTORY--Julius W. Taylor, M.D.

Dr. Julius W. [Bill] Taylor was with Aramco from 1954 to 1978, serving as assistant chief surgeon, chief surgeon, chief of staff, Clinical Services, and for his last ten years, as medical director. His recollections thus cover twenty-four years at Dhahran Health Center--years that were crucial in the growth of health care in Saudi Arabia and in preventive medicine and other public health programs fostered by the company.

Taylor's recollections cover a broad area concerning the Aramco medical department. He discusses patients and diseases, research undertaken, medical response to trauma, hospital administration and accreditation, outreach efforts, contract hospitals, and life as the Aramcons lived and enjoyed it in Saudi Arabia. Reporting to oil company management presented an unusual situation for a surgeon and hospital director--and that was only one of the many unique aspects of Taylor's career. The anecdotes he recalls illustrate the interest of life in Dhahran and demonstrate his enthusiasm for his work. He proved to be a fascinating story-teller and an informative narrator.

Taylor was interviewed on April 18, 1996 in his office at Boston University Student Health Services where he has been director since 1988. The transcript was lightly edited by the interviewer, then reviewed carefully by Taylor. He made many corrections which helped clarify and explain the information, and added useful and enlightening comments.

Carole Hicke
Project Director

January 1997
Regional Oral History Office
University of California, Berkeley

BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

Your full name Julius W. TAYLORDate of birth Holtville - 12/12/22 Birthplace Holtville CALIFFather's full name HENRY WALTER TAYLOROccupation FARMER Birthplace Augusta, KentuckyMother's full name NANCY STRAWN TAYLOROccupation Housewife Birthplace LA GRANGE, KentuckyYour spouse Lois A. DerbyYour children Scott Derby Taylor
Sandra Lee TaylorWhere did you grow up? CALIF 1922-30; Kentucky 1930-46Present community Boston Area MAEducation University of Louisville - B.A., M.D. 1946Occupation(s) Surgeon - 1955-1968 AramcoExecutive Director Aramco Med. Dept. 1968-1979Areas of expertise MIDDLE EASTERN SURGERY AND MIDDLE EAST HISTORY
MEDICAL ADMINISTRATION - HEALTH CARE DELIVERY SYSTEMS
PROVISION OF STUDENT HEALTH CAREOther interests or activities TENNIS, GOLF, DEEP SEA FISHING, WRITINGOrganizations in which you are active CHAIRMAN, CHARLES RIVER GROUP
ONGOING PROVISION OF STUDENT HEALTH CARE - BOSTON UNIV; HARVARD,
M.I.T., WELLESLEY, URI, SIMMONS, BOSTON COLLEGE, BRANDEIS

I BACKGROUND, EDUCATION, MILITARY SERVICE

[Date of Interview: April 18, 1996] ##¹

Hicke: Let me start by asking you when and where you were born.

Taylor: I was born in Holtville, California.

Hicke: What was the date, please?

Taylor: 12/12/22.

Hicke: And did you grow up there?

Taylor: I grew up there for eight years. My father was a truck farmer, so we ran a little farm down there in southern California. I was there for eight years; he was there for a little longer. After that, we moved back to Kentucky, where my family was originally from. We're from Kentucky, basically.

Hicke: Where in Kentucky did you live?

Taylor: We moved to Louisville.

Hicke: Now, let me ask you how you got interested in becoming a doctor.

Taylor: That's very simple. My mother was what we would now call a medical assistant. She worked in a doctor's office in Holtville and Louisville. There was a doctor that she worked with for several years. And so as a result of that, she was convinced that my brother or I should become a doctor. As long as I could remember, she was saying that: "When you grow up, you should be a doctor." When I was little, that didn't mean much to me; but later on, people would say, "Well, you're going to be a doctor?"

¹This symbol (##) indicates that a tape or a segment of a tape has begun or ended. A guide to the tapes follows the transcript.

and that's how it happened. So I just took the doctor's track and stayed on it. It was my mother's strong influence that resulted in that.

Hicke: How did you pick your university and medical school?

Taylor: It was interesting because when I was in pre-med and the--

Hicke: Where was that?

Taylor: I went to DePauw [University] initially, but I had to leave there because my father got sick. As I finished up pre-med at the University of Louisville, World War II broke out; we were just automatically enlisted and designated to go to the University of Louisville. They called it ASTP, which is the Army Specialized Training Program--also quaintly known as "all safe till peace" unit.

Under that program, medical school was sped up then: you only went three years, as there was no summer vacation; you just went right around the year. I think you had a couple days for Christmas and the holidays, and that was it. We got through medical school in three years instead of four. I graduated from the University of Louisville Medical School in 1946.

Hicke: Did you have to go overseas?

Taylor: I had an internship in New York, and in that little interim there somewhere, the war in Europe ended. So while I was in the internship, I was still retained in the active reserve, which meant that I was still at their beck and call. When we finished the internship in 1947, I went into the military on active duty for two years.

Hicke: Where were you?

Taylor: First, I was in San Antonio, Texas. Then I was transferred to Belleview, Illinois, which was Scott Air Force Base, completing two years of active duty.

Hicke: Were you in the air force?

Taylor: At Scott Air Force Base, I was in the air force. As a matter of fact, the air force used to be part of the army. And then they split, so the air force became an independent arm of the military; so I transferred into the air force. I was in the air force for the last year of my active duty.

Hicke: And what did you do when you got out of there?

Taylor: I went into a surgical residency then, back in New York at the Kingsbridge Veterans Hospital. I spent four years there, from 1950 to 1954.

II JOINING ARAMCO

Interview and Appointment

Hicke: Now, how did you happen onto Aramco?

Taylor: An interesting thing happened: a predecessor of mine at the Kingsbridge Veterans Hospital, a fellow named Dr. Johnson, had gone over to Aramco and done one tour, and was coming back.

Hicke: What was his first name?

Taylor: I don't remember.

Hicke: He must have been there very early.

Taylor: He had a tour of surgery there for two years. He came back, just passing through--he was on his way to Philadelphia--singing the praises of Aramco, what a wonderful time he had, and how much exciting surgery he did, what an exciting adventure it was, and so forth, so on. After I talked to him, I decided I really wanted to do this. He said, "Well, my job is open." He called up Aramco--at that time, one of the bases was in New York--and I talked to a doctor named Ted Allen, who was the medical director in the States. We talked, and subsequently I was employed for that job. That's how that happened.

The residency was hard work; I'd been there four years. I thought, "Well, I'm going to do this. It's going to be fun." And I'd gotten married just at the time my residency started, so we were going to take a little world trip and have some fun after that, and just enjoy ourselves, at least for one two-year contract. So that's how it started.

Hicke: And you figured on two years?

Taylor: Two years. At most. [laughter] That didn't work out that way.

Moving to Dhahran, December 1954

Hicke: Tell me what your impressions were of Dhahran and the health center when you got there. This was '55 that you moved there?

Taylor: No, '54. I was supposed to finish my residency through December. Aramco said, "Oh, no. We need you badly. We've lost a surgeon. And we have to have you right away." In fact, they became very adamant about it: "You must go now." So I actually left the States on December 11. I left my training program--the people running it at the hospital were unhappy because they had to cover me for that. And that was not easy, since that included Christmas, and people wanted off for Christmas. But I'll never forget the New York office; Ted Allen, in particular, said something like, "Either go now, or you're not going to get the job." So I finally got everything together, climbed aboard the *Flying Camel*, one of Aramco's transcontinental airliners, and began what turned out to be a lifetime overseas adventure.

When I got there, I was appalled when I found out they didn't know I was coming. I thought, "This place isn't as well organized as I thought." Because I'm standing in the airport building which, at that time, was a World War II quonset hut. It was wide open; it was noisy; there was nothing. And when you first went in, you thought, "This must not be it." [laughter]

Hicke: Wrong place.

Taylor: So I was just kind of standing around, and I remember a woman, whose name was Johnnie Rusher, came up and said, "Are you our new employee?" I said, "Yes." She said, "What's your name?" I told her. She said, "Well, you're not on my new arrivals list." "Well, by chance," she says, "The chief surgeon is a fellow named Lonas, Hal Lonas. Hal happens to be here meeting his children who are coming home for Christmas." So she took me over and introduced me to Hal Lonas; and he said, "What are you doing here now? I said, "Well, Ted Allen told me the surgery cases were backed up and I was needed desperately." He said, "Well, we're very slack now. We're slow. It's Christmastime. I can't imagine you came here and missed Christmas at home." And I said, "I can't imagine it either." [laughter]

Hicke: So you would say there was maybe a lack of communication--

Taylor: Definitely.

Hicke: --between New York and Dhahran?

Taylor: Well, Lonas, who was my chief, mentioned that he knew they were interviewing me. But he said, "I haven't gotten any information that you were hired or that you were coming." In those days, communications were obviously not as quick and accurate as they are today. So there was frequently a lapse in the communication, Sometimes this was funny; sometimes not so amusing.

Hicke: Are we talking about technological lapse or a lapse in a--?

Taylor: Technological, because mail in those days, even air mail, special delivery, whatever you did, would take two or three weeks to get from New York to the field.

Hicke: There was no telex?

Taylor: Yes, but only for important messages. Even telephoning was very difficult. It wasn't until the seventies that you could finally pick up a phone and call the States. And even today, if you pick up a phone and try to call Aramco, you'll run into a little trouble, but not like those days. Sometimes the message simply did not get through. The next time I saw Ted Allen, I said, "What was all that about?" He said, "Well, I had to get you out there, and I wanted to get that done." I told him, "They didn't happen to know I was coming." And he said, "Well, they should have."

In those days, your wife couldn't go with you when you went. Aramco had learned that when husbands and wives came together, all too often they said, My god, what have we done? And they would up and leave, and for good cause. In those days, it could be rugged going; it was a far cry from Stateside living conditions. So wives would come, and after a short time, they would say, "This is crazy. I'm leaving." So Aramco decided that the best way was to bring in the employee, let him get settled, and then bring out the wife--at least into more reasonable circumstances.

It's hard to describe the emotional reaction, because it was departure from a Stateside routine into a strikingly different existence in Saudi Arabia. A far cry from the U.S., Europe, or even the Orient. It was simply too much for many new arrivals, and they would turn around and go home. This expatriate life demanded rugged people, both in body and soul.

Later on, as I went along, I met a newly hired woman doctor. She too was welcomed at the little quonset hut. She walked down the steps, and I was there to meet her. She looked around and she said, "This is it?" I said, "Well, this is the airport." She said, "You're kidding." She went over to the counter, and she said, "Don't even put my bags through." She never left the

airport. She got back on the same plane and took off for India. That was our shortest hire of all time!

Hicke: You wonder what she was expecting.

Taylor: It was a hot day. When you walked down those metal steps, your feet would burn. When she stepped out, it was probably 110 degrees F--and it was very hot. Between that, a little sandstorm, this hut, and the customs people one had to go through, it was too much for her. And in retrospect, she probably did the right thing, when she quickly decided it wasn't for her.

So when you got out there, you have this delay with your wife coming. Aramco finally shortened it to six months. When your wife arrived, you had to caretake houses, because you couldn't get your permanent assignment. We moved six times before we got into our house. That gets to be a drag when you keep moving around. You might get a good house, you might get a lousy place, you know. So that was an indoctrination in itself. In fact, I've always wondered if my wife stayed because of the adventure and travel or because of the challenge. She's a New Englander, and she liked the New England area, and this is just about as far away from that as you can get. Anyway much to my surprise, she stayed and stayed.

III DHAHRAN HEALTH CENTER

History

Hicke: Tell me about the Dhahran Health Center. What was going on there when you got there?

Taylor: Well, the health center was in a state of early development and in the early stages of providing comprehensive care.

Hicke: Can you tell me about Dr. T.C. Alexander?

Taylor: Dr. T.C. Alexander was the pioneer doctor of Aramco medicine. He was the first doctor. When he started, he had a nurse and a first aid station in a little building. He continued on several years after I arrived. As I heard it, he was with the American oil group. In fact, he was sort of a legend, because he was originally in Bahrain, and when oil was brought in at a wildcat drilling site in Dammam, he came to Dammam and set up a medical station. Dr. Alexander was legendary and people came from far and wide to see him. After it was established that there really was major oil in the area, he moved to the Dhahran compound. They had this very small, almost like a first aid station. He was a well-trained general practitioner, so he did a lot of things: he did surgery--fixed hernias, did appendectomies under spinal or local, which was pretty rugged stuff. In those days, there was a good British hospital in Bahrain run by Dr. Snow. It was my understanding--I wasn't there then, obviously--if anybody got too sick for Dr. Alexander to manage, they'd take them over to Bahrain and treat them over there.

They went from a tent, actually, as I understand it, into this little building. Around that building they built their first small hospital. It was rustic; it was like World War II. You have to remember this is right after World War II, and a lot of these people that were there were veterans of World War II. Hal Lonas was a commander in the navy as a surgeon. He was the chief

surgeon, and there was a chief of medicine, a fellow named Curtis, and several others. Dr. Robert Page, at that time, was the medical director. When I arrived there was a Dutch surgeon, Peter Van Dooren, an Indian surgeon, and an Arab surgeon, Dr. Fyak Abdi, who later became chief surgeon.

The thing about the hospital which remained true throughout was that the hospital care evolved slowly but surely along the lines of current American medical care. There was never a clear-cut policy as to who decided what level of medical work would be done. So the medical work that was done there was like in a field hospital in the military. We operated, and we did all kinds of traumatic work as well as medical work. Today you'd say that was primitive, but in those days, it was consistent with a good military hospital.

We had all the modern drugs we needed. We had good operating rooms and good supporting services. Good x-ray and lab facilities. In general, the hospital worked at that level, which was quite good. Excellent records were kept on all patients, both inpatients and outpatients. The people there were well trained: most of the top professionals were board certified. Dr. Lonas was a board-certified surgeon. Dr. Robert Page, as a matter of fact, was a board-certified internist. Fred Howard, M.D. was chief of Pediatrics. Dr. Curtis was chief of Medicine. There were two G.P.s who headed up the OB-Gyn section: Dr. Robert Brown and Dr. Ivor Morgan--in fact Dr. Brown delivered my son, Scott, in 1955, Dr. Morgan my daughter, Sandra, in 1958.

Patients and Cases

Concession Agreement

Hicke: Who were the patients, besides Aramco employees?

Taylor: The patients were the same from the beginning. Gelpi was looking for the original medical agreement with the government. I read it once in some book.

Hicke: Oh you did? I've inquired myself, and was told that nothing was written down.

Taylor: I'm just recalling this from long ago. It was a one-sentence agreement; and it said in the concession agreement that "Aramco

would provide medical services to all employees and their dependents in that area." That's all it said.

Hicke: They put it in the original concession?

Taylor: That was in the original concession. You've got to remember, when that concession was written, in 1936, there were only about fifty Americans there, and very few Arab employees. There were very few dependents at that time. This was a pretty barren area in those days. Most of the Arab employees migrated there. They didn't start there, so their families were not around. I think I read somewhere the original total responsibility was something like 300 people. There were about fifty Aramco guys; the nurse was there; very few women, two or three women as employees; and originally, there were maybe only sixty-seventy Arab employees. Because at first, they were just exploring, and the first well, Dammam No. 7, was a small producer. So that original concession agreement was very simple. Nobody ever anticipated at that time what the medical program would eventually amount to. In 1968 there was a direct medical responsibility for 40,000 employees and 160,000 dependents and an indirect responsibility for major illnesses of the 2 million people in Eastern Saudi Arabia. The president told me one day, "We do more medical business here than we do oil business!" [laughter]

Hicke: Who was the president?

Taylor: Well, there were several presidents during my twenty-five years. [Added later] There was one thing they had in common: The Aramco medical responsibility was low on their list of concerns. From my viewpoint an Aramco president wanted good, middle-of-the-road medical care. This meant we should be able to manage all run-of-the-mill medical problems as well as a small-town hospital in the States. I agreed with this level of care. What we did we did well, but we were not a Mayo Clinic--this meant that everyone dependent on us ran a certain medical risk by working in Saudi Arabia. We did not have surgical or medical specialists. [end of insert]

Hicke: Did you know Tom Barger?

Taylor: Fred Davies was president when I first went there. He was one of the original guys, as was Tom Barger, by the way. Fred Davies was the president when I got there, and after him came Barger. I knew Tom Barger quite well and took care of him and his family many times. Originally, it was a small MASH-type outfit; later this hospital was built. As a hospital, it had three wards on it: medicine, surgery, and OB/GYN. It had two well-equipped operating rooms; it had an x-ray unit in it. And the surgical equipment was

all good; it was modern and geared for the level of care we intended to deliver--"we" being somebody else who decided what we were going to deliver.

OB/GYN; Burns

Taylor: At that time, there were very few women, so obviously very little American OB/GYN work was done in the early years. That was a minor little side. But there were Arab women who came in there for deliveries, so we did have the OB/GYN ward. Of interest, Arab husbands frequently insisted on being present for pelvic exams.

One ward was set aside for burns, because there were many burns. They used a British stove called a Primus stove, and that stove was dangerous. The clothes of the Arab people were long flowing dresses and robes. It was all too common for the stove to explode when it was being pumped up for use, and these robes would catch on fire.

Hicke: Is it a cooking stove?

Taylor: Well, it's one of those things you pump up and get the pressure on the gas. You cooked on it and used it for heat as well. Thinking back, I think most of the fires occurred when they were lighting it. Because you'd pump it up, and then I don't know what went wrong, because it would puff out with a flame and catch them on fire while they were trying to light it, causing severe, extensive burns. These patients frequently died, and if not, were on the burn ward for months for treatment and skin grafting.

Dental Service

Taylor: Early on, we had a dentist. Initially he did fillings and extractions.

Hicke: Did he have the necessary dental equipment?

Taylor: Yes. He had a small office with what we would think of now as essential equipment. He drilled out cavities and put in fillings, pulled teeth, fixed broken teeth, and that sort of thing. He was a very good general dentist. The dental service grew rapidly and later expanded into the biggest dental unit in the Middle East. Still is today.

Hicke: That was while you were there.

Taylor: Yes. I think they were building up to fifty dentists, covering every phase of dentistry. We had all the subspecialties. It was kind of interesting, because dental was easier to recruit for. Bernie Eggerman became the chief. He was an enthusiastic, dedicated, and well-connected pusher, and so he got a lot things done for dental, which was very good for everyone. They eventually offered quality dental care to all Aramco workers and their families.

Trauma

Taylor: The biggest problem in those days was trauma, because Arabs loved big American cars, and the roads were absolutely hopeless: no lights, no lines, no signs. It was just a strip of asphalt through the desert, through the easiest way they could go, and often drivers would simply cut across the desert; so they'd go over hills, around curves at break neck speeds, and it was extremely dangerous. The Arabs were not unlike the rest of us-- loved to drive fast.

The other interesting thing worth noting was that the Arabs, like earlier days in the U.S., would hitchhike all the time. It was almost an obligation for the Arab, if he saw somebody waiting along the road, to pick him up. So the cars were usually full of people; when they'd collide, as they often did, there'd be a helluva wreck, usually with multiple major casualties.

Literally, it was not unusual to have our ambulances bring in ten or twelve mangled people all at once. In the early years, up to 1965, Aramco had the only ambulances, and they would range long distances to help the injured.

Hicke: Can you describe an example?

Taylor: The worst accident I ever managed in heading up our ER [emergency room] happened to a big bus full of people coming back from the Hadj. They had pulled off the side of the road, but not far enough; Half of the bus remained on the road. I don't know what was wrong with the bus; it had stopped, so all the people were sitting there. This huge truck came along with a big grading blade which was up, and that blade went along and just literally sheaved off the outer half of the truck. I've forgotten how many got killed. I think about twenty. However, there were another thirty badly injured people screaming in the night pretty far from

this hospital. So by the time they were gotten to the ER, another five or six had died. That was the worst accident, as far as road accidents were concerned.

Such accidents were frequent. Very few days passed without major trauma on the highways.

Hicke: Mostly Arabs?

Taylor: Mostly Arabs. Occasionally, an American. Americans were wary: they wouldn't drive at night if they could possibly help it; they realized that these roads were dangerous. Arabs didn't think of them as being dangerous. So it was mostly Arabs who got smashed up in these automobile accidents. It's still true today. They've never done much to improve the road; at least when I left, there were still no lines, no signs, no curves. I think they finally got stop lights in some places, but out on the highways, it was every man for himself. And there were no speed limits; they'd go like the blazes, you know. And so it was a setup for trouble. That's where we got our most demanding medical work. I never ceased to have a little chill when called. In a "big crunch" the emergency room patients would be all over the place, sometimes on the floor or on the gurneys, sometimes stacked up on the ambulance platform.

Hicke: Did you call on every doctor available?

Taylor: No. We'd just call in the surgeons.

Staff Personnel

Taylor: When I first got to Aramco, there were six surgeons. Three were trained as board surgeons; the other three, who had become surgeons had become skilled in the hard school of experience. We all became trauma experts.

Hicke: Were these all Americans?

Taylor: Oh no. In fact, Dr. Lonas and I were the only two Americans at that time. There was one Saudi, Fyak Abdi; one Dutch surgeon, Peter Van Dooren; and one Indian surgeon, Cecil Smith from Bombay. Later we added a surgeon from Beirut whose name was Dr. Mikhail. He was an unusually brilliant and talented surgeon. That made up the surgical staff during my first tour of duty. Dr. Lonas was the chief, I was the assistant chief, and all of us worked together as a team. These surgeons were fearless and hard

working. Two of us were on call every third night and since very few nights went by without surgery, we were in the hospital eighty to 100 hours per week.

##

Taylor: One of the things that was interesting about the surgical theater was that the anesthesia was always given by a nurse anesthetist. Our statistics on anesthesia were surprisingly good. These nurse anesthetists were there for many years. They were very cautious; anesthesia was very light. These four American nurses did a remarkable job over all the years I was there.

Hicke: So they could probably administer but not handle emergencies?

Taylor: On the contrary, they were super with emergencies. They stuck to very simple anesthesia. The anesthesia they did was very safe and it worked. There were four anesthesia nurses available most of the time. If there was big trouble--why, we'd get as many of them as we needed, usually two or three of them. Usually, we'd run two O.R.s [operating rooms] at once, so there'd be one anesthesia person in each one. That was the surgical part. If you have watched the MASH programs, there was a striking similarity to the Aramco surgical world.

It should be understood that at the same time we were providing a full range of medical care. There was a medical ward, pediatrics, and OB/GYN. However, of special interest, there was no psychiatry service in the early years. There was no need. Americans were sent home. Arabs didn't go psycho.

About five years after my arrival, a new hospital was built. The medical business was increasing rapidly and more sophisticated demands were being made by the patients. The old equipment, the sandy O.R.s, the one-room lab, and waiting out in the sun to be seen--these were some of the problems that had to go.

Hicke: And this was nearby, across the road?

Taylor: The hospital was built on the main access road so that Arabs had quick and easy access--95 percent of the patients were Arabs.

Smallpox

Taylor: One interesting fact: when I first got there in 1954, they were having what was probably the last smallpox epidemic in history.

They had a little isolation building that they used. I was called to see one of the smallpox patients who had some kind of surgical problem, which turned out to be appendicitis. I went over there and took care of it. There were about ten patients in there with smallpox. As far as I know, I never saw case of smallpox after that in my life. Even though we were all vaccinated against smallpox, everyone taking care of these patients was very nervous. It's one thing to be vaccinated; it's another thing to be exposed and hope the vaccine works. It did.

Hicke: These were Arabs?

Taylor: These were Arabs. And this kicked off, with Aramco's help, a nationwide effort to vaccinate everybody for smallpox. Up until now the vaccination program had been spotty. Arabs didn't like being vaccinated. But now a royal decree came down from Riyadh, and nationwide vaccination was carried out.

Hicke: Which had not been done before?

Taylor: Well, some of them were vaccinated, but now all Saudis were vaccinated by royal decree.

Hicke: The youth had had some vaccinations?

Taylor: A lot of them had been vaccinated, but many had not. Some of people came from Yemen, which is south of Saudi Arabia, and had not been vaccinated. We hoped that was the end of that. One thing--I don't believe it's known to this day whether everyone is vaccinated for smallpox there or not. As you know, smallpox vaccination has been discontinued worldwide, because everybody thinks it's finished, you know, there won't be any more smallpox. But I often think to myself, maybe--because there must be areas in that part of the world they've never heard of a vaccine for smallpox. To believe that smallpox is really eradicated is highly optimistic. Since the Western world will soon have no immunity, an epidemic would be catastrophic.

So I think it's a little optimistic to think that it's gone forever; but so far, so good. And there haven't been any cases for a long time. So maybe it is finished. I hope it is. But that was an interesting thing to start with, a little smallpox epidemic; most medical people have never seen a case of smallpox. To be in on the last of the smallpox epidemics was a very interesting and exciting way to begin this fabulous adventure.

Hicke: How did they deal with this?

Taylor: The Arabs never fully understood the potential of a smallpox epidemic; very few even knew it happened. One must remember there was no dissemination of news about such things. However, the Arabs living in the Eastern Province knew about the Aramco Medical Center and would come long distances to be treated. No Arab was ever turned away, nor was anyone else who needed the services. However, once we had done all we could, then they had to leave our system.

Medical Care Responsibilities: Dependents

Hicke: It also raises the question of who you were responsible for.

Taylor: We got that clear, eventually, because what it boiled down to was very clear-cut: First we were responsible for all Aramco employees and all their dependents. This included all employees; at times, there would be as many as twenty different nationalities working.

We can take a second to discuss the dependent situation, because there was a long-running argument about that for many years. What Aramco regarded as a dependent was a wife--or wives, because many Arab employees had more than one wife--and the employees' children. Well, at one time, the average number of children was something like twelve. Average. So there were many families with eighteen, twenty, twenty-four kids. The number who had four wives was small; I think at one time it was like 10 or 12 percent of the employees had four wives. On the other end, there was 10 or 12 or 15 percent who had no wives: they weren't married at all. The biggest number of married Arabs had two wives; three wives was next; and then four wives was the least. This created a large dependent population of approximately 600,000. We provided quality care for all of them.

Now, what the Arab thought were his dependents were all the people who lived in what he called his villa; this often included more categories. Then Aramco had bargained for brothers and sisters and their children. Aramco decided the best plan was to just take care of all of them. So if an employee would come in with a boy, we'd take care of him. We learned our lesson: I persuaded Aramco management that we would just take care of all of them. We would have lost far more in our rapport than we'd ever save in money. The actual cost add-on was negligible anyway.

The second part of our obligation--which was clearly understood--was we would provide medical care to anybody who needed medical care that was not available outside of our

facility. And in the early years, that was everybody, because the local facilities were very, very spartan and meager. They had few specialists and inadequate equipment. So if a general public patient was diagnosed with appendicitis and he went to the local hospital, they would send him up to us.

On our side, we had complete backing of the government; if it was somebody that we couldn't do anything for--even if they were dying, like an advanced cancer case--we wouldn't take them. They had to go home, because there was nothing we could do for them. So we were very firm about only taking general public patients who were people that we could do something for medically. Once we had done what we could, such as take out an appendix, we'd send that patient home in a couple of days or send him back down to the local hospital, because the local hospitals did have beds and they did have facilities, but their doctor supply was limited. As far as I know, that level of responsibility still holds; so that even now, if somebody comes in who's not eligible and they have something that the local facilities can't handle, SAMSO [Saudi Aramco Medical Services Organization] will take care of it.

Hicke: Who established those guidelines? Do you know?

Taylor: I was the one who finally crystallized those guidelines, along with Aramco management. In a sense, and rightfully so, the administration out there and the parent companies thought of the medical system as a necessary evil. We had to have it for almost everyone. Once you have something for the Americans, you certainly won't deny the same level of care to the Saudis. It's also very difficult to say, "Well, we're going to have a good medical facility, but only for the employees, or only employees and their dependents, only employees and their real dependents." In other words, trying to delineate such fine lines was politically ill-advised. In looking back, any other decision would have been stupid.

Facilities and Living in Dhahran

Hicke: That's really interesting, because I think that happened in other than medical areas too, like electricity and water and air conditioning.

Taylor: Well, the AC, the air conditioning, was always a bone of great contention. It used to be amusing, because they used to call the Arabs who were inside the compound "AC Arabs," and that was a derogatory term. I heard guys say, "Oh, you're one of those AC

Arabs"--like you were a bad guy, you know. Health bears on it to some extent, because there was always an intense effort early in the early years for the Arabs who wanted to come into the compound and live inside the compound. At the same time, there was an intelligent and logical resistance to this, because there was such a difference in the social structures that this integration was very difficult. It wasn't easily done, and created major societal problems.

One day, an unusual Aramcon named A.C. Hill came in with what he thought was a solution. He was an American guy. He said, "I've got a better idea. We'll build good housing for these guys out in the communities. We'll put in AC, we'll put in running water, we'll put in toilets." And they did. That solved one of the most difficult problems of all, because the interesting part of it was the Arabs actually had more difficulty living inside the camp than the Americans had with the Arabs. The Americans would come in, living their way of life; and a lot of our customs were not acceptable to the Saudis. As their children grew up, they were subjected to the peer influence of our young crowd. And they didn't like that. The schism between the Americans and the Arabs was too wide and there was no meeting of the ways; it caused endless animosity.

So when we offered this solution, they thought it was great. In fact, as of today, the executive Arab compound is much better than the American compound--beautiful. We built it right outside, just across the road from the hospital. They didn't have to, but they wanted to: because these were better houses. There were the same kind of people living around them; and they had their own community; and they had all the amenities they could have inside the camp. That was a great solution. Up until then, it was becoming more and more of a very sore point, because the Arabs were saying, "Look, you Americans are living in there. You've got--." AC was their main complaint. "We're out there in the heat!" So remedial steps were taken, and the problem was solved by A.C. Hill.

Hicke: Did you see a lot of problems caused by heat in the Americans?

Taylor: No, oddly enough, because the only time we had problems was when the Americans would overdo it. They used to run a marathon, you know, as a sporting event. So Americans would run--I've forgotten how far they ran--but it was like twenty miles, and they'd get heat exhaustion. But you have to remember that the heat was only serious between July 1 and November 1. Up until then, it's like southern Florida; so in the winter, it was cool and the weather was generally good. So the hot weather was really mostly July,

August, and September--and then it was really hot. Almost always over 100 degrees, sometimes 120 degrees.

The other thing that had a big influence on the reaction to the weather was that it was right on the Gulf. When the winds blew in off of the Gulf, it was very, very humid, and it was so humid that the AC couldn't handle it. So the temperature inside the houses would go up into the eighties. That doesn't sound like much, but somehow or another everybody thought it was too much.

Hicke: The humidity certainly added to the discomfort.

Taylor: The humidity was bad, the heat was up, and people would get irritable and everybody was in a bad mood when that would happen.

Most of the time, the winds were from the north; *shamal* is the word for the north wind. When the *shamals* were on, they'd blow dust and sand all over the place; there'd be dust storms, sand storms. But most of the time they were blowing out into the Gulf, so you didn't have this intense combination of heat and humidity. But the *shamals*! Sometimes they'd last two or three weeks; these *shamals* were wicked. The sand would come through the doors, in the windows. You'd have to clean up everyday. Where I lived initially, I wasn't too concerned about it: the sand would get to be an inch or two high in my room. My roommates, who were meticulous, would come in and say, "What the blazes is going on here?" One guy got so upset about it, he'd come in with his own vacuum and he'd vacuum my room! I found this amusing; he did not.

Hicke: Can you vacuum up the sand?

Taylor: Yes. Then you'd pour it outside. So the sand storms were very interesting.

Hicke: Could it come into the hospital?

Taylor: Oh, it came everywhere. It did. Of course, the hospital had a little better AC--the new hospital. The old hospital? Well, when the sand storms were on, you knew they were on. We used to keep the blinds down, everything, to keep the damn sand out. But you couldn't keep it out; it was very fine; and of course when you opened a door, it would blow in. In the hospital, we had big vacuums. You know, we'd run around with those damn things and try to suck it all up. When the *shamals* were on, the sand was there.

Hicke: The operating room?

Taylor: The operating rooms were super insulated with double doors, triple doors, whatever--I've forgotten. It would be stretching it to say

that it was a problem. There would be a little in there because people walk through, but we finally said, "Oh well. Sand never hurt anybody."

Hicke: Clean sand!

Taylor: But those shamals were something to remember. It was sort of equivalent to a severe snow storm here. Everybody would get house-bound and irritable. I think the longest one ever lasted about a month, and it just wouldn't stop. Everybody got so touchy, you could barely speak to anybody, because the damn sand was everywhere.

The New Hospital

Hicke: You haven't told me about the new building. We got off onto something else.

Taylor: The new building--in those days--was very modern and very attractive, as they go there, although Aramco was always against anything architecturally attractive; it was practical. In fact, I initiated another new hospital just before I left. It was amazing, because we had two plans: one of them was an architecturally beautiful building, very nice, designed by some big architect from the States; it looked wonderful.

The other was one of these deals where they rebuild around the old building. And that's what they finally did. I'll never forget that, because I was on the board of directors at the end, and we were arguing over this building. The amazing thing was their approach to it: "Well, you're going to have this beautiful hospital sitting there right in front of everybody, and we've got these old ugly buildings. If we have this beautiful hospital sitting here, we're going to have to redo these buildings, and that'll cost us a lot of money." So they turned it down. We built around the old hospital.

Hicke: You were on the Aramco Board of Directors?

Taylor: Just at the end. I finally got on the bottom rung.

Hicke: What were the problems of moving from the old hospital into the new one?

Taylor: Well, we kept the old hospital: we kept using it. As the years went on, that became a health educational center. We did all

kinds of things over there in the old building: we ran a huge pregnancy program there for pregnant women, teaching them how to feed their babies; we had movies on how to change diapers, what a good diet for the baby was. That was one big part of it; that went on every day. Our industrial medicine was over there, and our own public health unit was over there, which was a big operation for us, for everybody. So we kept using the old building for very important functions which were not clinical medicine.

Then part of the time we used it for a place where we put people who were in medical trouble and couldn't go home. It was like a holding station. Those would be advanced cancer cases, some burns that we were working on that were going to take months to do. I think the OB/GYN delivery unit was the last one to move from there to the new hospital. So eventually, the new hospital was basically to take care of all current, ongoing illnesses, primarily clinical, and the old building was for preventive medicine, public health, occupational and health education.

Developing Psychiatric Care

Taylor: The other major area we finally developed there was the first psych ward. That always amuses me because when we were first there, we had no psychiatrists, we had no psych ward; we had essentially very little business and very little interest in it. But as the years went by, we changed that. When I left, we had a regular psych ward full of people, and I think it's sort of a measure of the impact of the times. We had two Arab psychiatrists and a large inpatient and outpatient service.

Hicke: Since we're talking about that, why don't you tell me how that developed?

Taylor: Well, it just evolved. It's a sad commentary on the Western world, I think, because most of our early psych patients were Arab employees. They came under the same pressures as everybody else: advancement, promotion, failure to advance, disappointments in the work site--things of this sort, and inability to keep up with the changing times and changing customs that were happening all around them. And so they had emotional problems. Originally, we had an American psychiatrist for the Americans. But he would also take care of the Arabs, most of whom spoke good English. As that crowd got larger with the increasing pressures of advancement, we finally got an Arab psychiatrist, because we had not only the

employees but their dependents who came in--because they too were undergoing major changes in their social structure.

I think the reason that the Arab people, in general, had very little emotional trouble is because their societal lines are black and white. They're very clear cut: if you do this, you're on the right side; if you do that, you're on the wrong side. Whereas in our society, not only are they blurred, I think they're probably almost gone: you get to the point where you think, "What can anybody do that anybody's going to do anything about?" But not there. If you do this, you're going to get that, so that they know from the youth on up what's right and what's wrong much more clearly, and so they have less trouble coping with that problem as time goes by. So there was not nearly as much need for psychiatric situations. Plus you have to remember in those days, there were no schools; they didn't go to school--

Hicke: The Arabs?

Taylor: The Arabs. I'm pretty sure it was into the seventies before there were any girls' schools. First they had boys' schools; and then eventually they had girls' schools. But even in the schools, the pressures were not severe; schools were 50 percent religious--half the day they taught the Koran, and the other half, they would teach various and sundry subjects that were germane to what they were doing there. They didn't have a feeling of pressure; they weren't trying to get into college. So the kids didn't have the pressure that our society puts on them.

So the emotional problems were very minimal, comparatively speaking. I think, rightly, now there are more, for very obvious reasons. But you still have clear-cut lines of right and wrong, so there's not as much consternation in the minds of the young people as to what is acceptable. I think there is less of that kind of underlying background to cause them to get into emotional dilemmas. Once they got into the company, and they were trying to move up, then they got into emotional dilemmas--just as we do.

Hicke: That's interesting that the work pressure is stronger than say, inter-sexual relationships and things like that.

Taylor: Oh, that was clear cut. That's why it didn't create problems. There weren't any inter-sexual problems, at least not that I was aware of: that was a clear-cut code. And it worked; it was there. They didn't drink, smoke, and do drugs, which create a lot of our problems in the rest of the world. The problems which loom so large here around illegal drugs don't exist there.

Accreditation

Hicke: Let me just mention a couple of things. In 1957, the health center was accredited.

Taylor: Right. That was in the new hospital. Obviously, I was there then. It was in the new hospital, because I ran that accreditation for the first time. There was probably a misconception in a way about accreditation, because accreditation, oddly enough, has very little to do with the quality of medical care; whereas it has a lot to do with the safety of the building, the environment of the building, the prevention of cross contamination amongst patients. It has a lot to do with the record keeping; they usually come in and pull twenty surgicals, twenty medicals at random, and then they'll go through them to see if the record is done right with physical examination and progress notes, nurse notes, et cetera. The format of the record was important, but the attention to actual clinical management was not criticized.

They don't get into "Well, here's a guy with TB of the kidney. What did you do for him?" They don't get into that. What they do is they say, "Okay. Here's a guy with TB of the kidney. You took his history and physical [examination]; you established the diagnosis; you kept progress notes on him. The record is a good record." We had opened up some extra isolation places, and that air-conditioning was not isolated from the rest of the hospital; so they said, "We will not approve until that's corrected." As a matter of fact, I will take the blame for that, because we hadn't thought about this cross contamination in the air-conditioning when these new places were opened. So we closed them down and fixed the problem, and we were approved. But that's the kind of thing they were more interested in--fire hazards, smoke detectors, hoses, all these things; they'd pull them out; do they work? The accrediting is very concerned about the physical plant. For example, we had to have an emergency generator. They'd go around and flip it on. And if it doesn't work, you don't get approved.

Secondly, they are concerned about the quality of the chart itself, but not about the medical care. That's a big misconception. Because people say, "Mass General [Massachusetts General Hospital] is accredited. It must have great medical care." That's not true. What it means is "Mass General is a great medical plant. It has a great facility." Now, at the same time, if you do keep your records well and you do have everything in, it does promote good medical care, obviously. But nobody comes around and says, "Hey! This surgeon isn't seeing his

patients post-op. How come?" That didn't happen. That doesn't happen today, either.

Hicke: How did you go about getting the accreditation?

Taylor: I had been in accreditations back here to begin with, so I knew what they were about. And they send you exactly what you have to do.

Hicke: Do you request it?

Taylor: Oh yes, you have to request it, and you have to pay for it. They'd bring a whole team over. Originally, it was four; eventually, it got to be ten.

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Taylor: In general, in the intervening times, we kept things up to accreditation levels, because once you were accredited and you're claiming that you were accredited, you should function at that level; and we did. Accreditation is an ongoing process, and once achieved, no one wants to lose it.

Hicke: How often did you have to get inspected?

Taylor: I think it was a two-year interval, unless you were on probation; if you were on probation, it could be as short as six months. They'd say, "Okay"--like this air-conditioning thing that was found in June--"we'll be back in January to confirm that this is approved and then you'll get your reaccreditation." So I think it was two-year intervals, and then if there was anything amiss, they'd tell you what it was and give you so long to fix it. If you didn't fix it, then you lost your accreditation.

Those were always stressful, because everybody had to run around and make sure everything was up to snuff--that all the physical plant operations were right, and that all of the records were complete. The records, in general, were well maintained. Now, the records were what separated us from the rest of the medical centers in the Mideast, because record-keeping in most of the world is a very marginal effort. As the years have gone by, precise record-keeping has become increasingly important.

Hicke: You're talking about medical records?

Taylor: Medical only. So if you go into--as I did--go into a hospital, oh, we'll say in Iraq--where we went--you would be very hard pressed to figure out what's happening to the patient by looking at the record. So that's a bad thing. England is very good at

records; they're the only country that has decent records. Ditto for Canada. The rest of the world just doesn't think that the records are that critical, and doctors are somewhat negligent about maintaining records. They don't like to do paperwork, and they just ignore it if they can. The nurse's notes also count, because you want to know what happened, and often the mandatory notes by nurses tell the real story.

So we kept very good records--not only there, but in the outpatient clinic. At one point in time, we were regarded as the largest, well-organized outpatient clinic in the world. That meant just what I'm saying: when people came, you knew you could review their record and see what happened. We were seeing over two thousand people a day in these clinics. It was a big step, because we had far-flung clinics all over that Eastern Province, as the area was called. We saw all these people I was talking about, plus the local people who would come into those clinics. And each and every one of them was identified and had a record--retrievable, and kept in proper sequence, filed properly. It was all part of the system.

Hicke: And no computer!

Taylor: No computer in those days, but excellent handwritten records were always available. Whereas if you go into many non-American areas and you say, "So this patient was here last month; let's see what happened," there's no way you'll find out. You might ask him, and he might not know. That's one of the criteria of accreditation, record-keeping, that separates good American medicine from others, in that you know what has happened to people and you can maintain some continuity. TB is a big problem: you have to know what drugs they're on, how much they're getting, how long they've been on them, and whether they actually are--this kind of thing. Otherwise it's very difficult to do your job right. We did do that very well in Aramco.

We were a very organized system. In other words, the doctors were all employed by us; all the doctors had to work to a certain standard; we were constantly doing peer review on everybody; there were no outside doctors who came in on an occasional visit basis--none of that. It was all a very controlled system. So we even got high marks on that. If you go down to our hospital here, there'll be guys who come in and see a patient once a month, and they may or may not fill out the records, and the poor records people are chasing them all the time: "Please fill out these records." And they may be three to six months old or may never get filled out. We didn't have any of that. That was one of the key things, and that, we did well.

They were big on the lab. We had a very good lab. Good blood bank; the only blood bank in Arabia at that time.

Hicke: Did you collect it yourself?

Taylor: We had a whole blood bank system, where we'd collect the blood and have blood on tap for operations and major bleeding problems. It wasn't easy. There was great resistance to donating blood, as there is in most countries. They didn't like to donate blood. It was understandable. They just couldn't visualize why we thought they should give their blood to somebody, particularly somebody else who wasn't related or close to them. In fact, most of the blood was donated by Americans who were conditioned from World War II about giving blood.

Hicke: Did the government give any help on that?

Taylor: Not on that. They had their own problems, which were worse than ours: trying to get it in their own hospitals. It was just practically impossible to force anybody to give blood. It's just an impossibility. There was a long, historical background in that society that being bled was not a healthy thing. It was very hard to overcome. But we did have a reliable blood bank, and we had very up-to-date cross-matching techniques; we didn't give the wrong blood to the wrong people. So the lab, the blood bank, the x-ray unit--which was very modern--they were all good. In other words, the supporting services to the clinical medicine were strong. That's what makes good medicine.

We tried to keep up in these areas, although I remember when we wanted a CAT scan operation, that was hard to get. Whenever we went up to management with a major expense item, which I would usually present, it was often amazing to me how difficult it was to sell it. They've done it since I left; but when I was there, I was still trying to get this CAT scan in. I must have been ineffective.

Hicke: How much did they cost?

Taylor: At that time, that unit was going to cost \$600,000. Back in the late sixties-early seventies, Aramco management would think, "Gee, that's a lot of money," you know. And their question was, "Do you really need it? What can you do with that that you can't do now? How much good is it going to be?" And in the old days of CAT scanning, when it was still a little bit dubious--"What can the damn thing do?"--you could be hard pressed, as I was, to prove to them that you had to have this sort of thing.

It was interesting, because we had the same sort of thing when it came to computerizing. In my last years out there, there was a big push on to computerize the hospital. We partially computerized it. This was my decision right along. Being computerized has obvious advantages to it. The big problem with us was when it would go down. For example, they wanted to put all the drug system on computer, which they do in many hospitals now. If you're on a ward, the computer will say, "Send up six shots of penicillin to ward six for these numbered patients, and each one of them gets the shot at four o'clock this afternoon." And that comes up on a tray and the nurse gives them. So it's all done by computer; you ordered it by computer, it comes back by computer. Well, I wouldn't do that.

The other thing they wanted to do, which fascinated me, was to put in a computerized delivery system: it's like a little train that fits in the walls and that would take drugs, food, messages to various destinations. They have that in many places. In the pharmacy they just put them on in the proper sequence, and then they would go around to the various wards and they would get offloaded. Well, that's great until it breaks down. Because in this case we have two things to break down: the train itself and the computer. And we were already having trouble in other parts of the company with the computers. When they'd break down, it was a helluva job to get them fixed. When the King Faisal Hospital went on with computers, they finally had to hire a twenty-four hour team from Japan to maintain the computer. Sony. Because if it once goes down, the hospital--like the King Faisal Hospital which I consulted on to get it in operation--if a computer goes down, the system fails, chaos reigns. So if the drug system goes down, there's nobody to get the drugs from the pharmacy to the ward, the food from the kitchen to the patients, et cetera; the hospital doesn't function.

It becomes chaotic--which they found out the hard way. The lab was on the computer, and the lab computer goes down. The whole system breaks apart, because you order by computer; once you can't order by computer, and you have to go back to the old handwritten delivery system, why, you have a serious problem. As a result, in Aramco we only computerized in a modest degree. And I'm sure since I left, they've probably updated that and have a fully computerized system by now.

Hicke: It's probably much more reliable by now.

Taylor: It's more reliable, as they now have what we call a mainframe system, because Aramco is totally computerized. They have a home team out there, employees who are computer experts, so they can come down and keep the computers running. And they have the parts

in store and this kind of support, which we didn't have originally. We had to fly them in. So that was a problem. But now, I think--I haven't been back--but I suspect it's fully computerized at this point in time--it should be. They've got the money and they should do it. That's how that evolved.

Hicke: Well, we were just on accreditation business. Can you finish that?

Taylor: Accreditation became a way of life. The funny thing about accreditation is that once you're accredited, it's very uncomfortable to back out of accreditation. And occasionally, you think, "What good is accreditation? I mean, we know we're running a good outfit." The good, I guess, is, like every year when we'd get accredited, it would come out in the local paper that we were re-accredited, and everybody would breathe easier thinking, "Well, we have a great medical system because we've been reaccredited by the joint commission." It had a good public relations impact.

The problem was--the part that people failed to realize--a hospital may be accredited, but it may not be doing good medicine. That's what people don't know, because they automatically think, "If it's accredited, it must be doing great medicine. It must be medically up to certain standards." That's true. I'm not against it, because it certainly is an incentive to do medicine right. In other words, it's better to be accredited and at least kept to that level, than not to be accredited and work at some lower level. So we kept doing it, and they are still getting accredited as far as I know. It became an established thing, and as far as I know, it still is. Being accredited is definitely a positive factor in having a medical system.

Medical Training

Hicke: Let me ask you a little about teaching duties. You indicated you had some teaching duties all along?

Taylor: Yes. We became accredited by the Royal College of Surgeons, which is somewhat equivalent to the American Board of Surgeons in the U.S. After this, surgeons who worked in the Aramco surgical system could get a year of credit towards being a fellow in the British College of Surgeons.

Hicke: When was this?

Taylor: This was in 1961. That was a representative from the Royal College, Dr. H. Wells, who was there to accredit us. He came down and went over our system, came in and watched us operate, and actually operated with us. He spent, I think, a couple of weeks there to approve us, our training; and we were approved, so that people who worked with us could get time credit for becoming a member of the Royal Academy of Surgeons. And several did become members. They had to go to England--usually London. We were good for the first two years, but after that they had, at some point in time, to go up and do two more years--sometimes more than that--to finally get to be a Royal College-accredited surgeon. This was good for us, because it kept us on our toes. Every two years we had to get reaccredited by the R.C. of S.

When they developed a medical school in Riyadh, some of the students would come over and work with us as interns. That was probably around 1970, I would guess, thinking back. So we trained those people. And then we trained our own people, extensively. We had training for lab, x-ray, all kinds of technical support. When we got new doctors in, we trained them. When we hired a new doctor, they had to go through a year of training; they had to go through their first year being closely under a supervisor who was making sure that they did things "our way," so to speak. There was no medical school in our area then. There may be now. In fact, it was in the wind when I left, that there'd be a medical school in Damman. So if that's there, I'm sure that they will use the SAMSO hospital as a training center. But that was after my time, so I don't know. When I was there, we did the necessary training to guarantee quality of care.

IV CAREER DEVELOPMENT AND RESPONSIBILITIES

Chief Surgeon, 1961-1963: Hiring Staff and Relationships With Management

Hicke: Okay, let's go back to your career a little bit. You became chief surgeon in '61? What kinds of responsibilities did that mean?

Taylor: Before that, I was the assistant chief surgeon [1953-1961]. Dr. Lonas resigned, and then I became the chief surgeon. As the chief surgeon, you were over all the surgical services, not just general surgery. OB/GYN, orthopedics, urology, whatever surgical activity was done was under the chief surgeon. This was an interesting little phase of development, because Aramco management was slow to accept progress in these areas. This was very disconcerting, because one of the things that has always amazed me in life--it shouldn't, but it does--was how some of my most intelligent friends have a paucity of knowledge about medical people and what they can do. And a lot of people would say to me, "Well, you're a surgeon." And you were considered to be competent in all fields of surgery.

But American management, coming from the old days--World War II, when the surgeon is out there doing all kinds of stuff--had this vision of the general surgeon being able to do all these things. As a matter of fact, we were occasionally doing things that were beyond our scope. I used to do severe head injuries, and operate on brains and skulls that were caved in and things like this. This was very complicated surgery. We did a pretty good job under the circumstances, but as far as doing it as well as a neurosurgeon--that didn't happen. For unknown reasons, management was extremely resistant to appropriate progress in the Medical Department. This was penny-wise, pound-foolish management by Aramco and should have been changed long before it was.

Hicke: Did you feel you wanted to hire different specialists?

Taylor: The first specialist we finally got was an orthopedic surgeon, Dr. Charles Thomas. I'd been there long enough that I usually knew the top level managers. Every president after Hardy was a good friend of mine. We were good friends; and I'd say to them, "I cannot understand your approach to this when you may get hit in a car next week, or your wife, or your kids, and have bones broken, and we'll have guys down there fixing them, including me, who aren't nearly as good as an orthopedic surgeon." It was just beyond me, because, between us, there was never a true money problem. What a joke Aramco didn't have enough money to hire a good medical staff!

Later we did have a chest surgeon who was a general surgeon and specialized in chest. But it was just like pulling teeth. You'd go up time after time, and some of these upper-echelon managers who were resistant to this would say, "Well, we've gotten along without them. Were there any major problems because we didn't have them?" Well, the true answer was "Yes"! [laughter] But luckily, I guess, for everybody, it wasn't very often. So that was one of my most difficult tasks, one of the most difficult to accomplish.

Hicke: Not all of them, but most of the presidents and CEO's felt the same way?

Taylor: Well they seemed to.

They don't think about it until they're sitting at the table and I say, "I want to hire an orthopedic surgeon. He's going to cost so much money. We need him."

And they'd say, "Well, how come we need him now?" And then, "We never had one up until now, you know."

"Well, the world is changing."

There was a day, back in World War II, at Mass General, when orthopedic surgery was done by general surgeons. They weren't really specialized as orthopedic surgeons. But that went by; we didn't go by with it very easily. I think it was one of these decisions where they saw it as sort of a major change and were just resistant to the decision. And after I'd leave, they'd probably say, "Well, old Taylor is up here pushing to get this. We'll put that off for a while and see how things go." And it gets turned down again.

When I left, we finally had gotten a good orthopedic surgeon. We had a good chest surgeon. And that was their attitude: "We're getting along okay. What's the problem?" There were a couple of

bad accidents amongst what we called in those days the senior staff, and that helped push that along. Because I made no bones about it: if we don't have the right guy, we are going to have major setbacks in the specialty fields, much to the sorrow of those involved.

It was a bad decision on their part, as far as I'm concerned. Now they might say, "We saved three million dollars over the years by not doing it." But they really didn't: they had general surgeons doing it, who weren't as good, and they wouldn't have paid the specialists any more than the general surgeons. Now for neurosurgery, for example, they said, "How many neurosurgical problems would this guy see? Would he be fully employed? Would he be working?" "Well," I said, "I don't know about that. But let's look at it generally. Suppose there's one that comes up tomorrow: a guy comes in with his head mashed in, and we can save his life and return him to normal. And that may be his only big case of the week. Maybe you only do fifty of those a year. No, he's not working on a big case every day." That was an interesting decision on Aramco management's part. This slowed down the progress that should have been made.

Hicke: Quantity is not really the issue, is what you're saying?

Taylor: That was hard to do, and that remained hard to do throughout my entire time there. It was hard to keep the system moving with the times, which I could never understand. I just couldn't understand it. Bob Brougham was one of my real solid friends; I finally convinced him. I said to him, "I'll tell you something interesting. The thing that people will remember and appreciate most about Aramco is the health care. The money is okay, but when somebody comes in really sick or really hurt--they have something wrong with them--and they get good medical care, they remember that. I think if you take a poll of all the Arab employees and say, 'What about Aramco do you like best?' you'd get 99 percent saying the medical services. And not only that, but we take care of all these other Arabs, including the royal family who come to us all the time. Now what better way to befriend the country?"

I said, "I just can't believe that they don't think it's a great benefit to them, and that Aramco is a good citizen because they're providing these kinds of services. If you eliminate medical services, I think there'd be a very unpleasant reaction to that." Management often would say, "Let's tone down the medical services." As I was telling you originally, they used to accuse me: "You're building a medical empire!" Which I was, because it should have been done. I told Brougham, I said, "It's easy to afford it. It's a worthwhile goal. Because the way we're doing is too slow and cost-conservative. We're not out here building a

Mayo Clinic. But we want to be working at a certain quality level, and we sometimes do not measure up to the quality Aramco should provide."

So you were mentioning in there [in the outline], "What was the relationship between the Aramco administration and medical?" It was not what it should be. Aramco was not concerned enough about providing the proper quality of care.

Then on top of that, of course, the Aramco administration was always caught between the parent companies and the field. The parent companies were surprisingly resistant--"It's a business. The bottom line is what counts. Whatever is going to cost a lot of money, we're going to be against, unless it is in concrete that it must be there." So, our people were a little reluctant to bring up, say, the CAT scanner for a million bucks or whatever it was, because some guy from the parent company was going to say, "What the hell do you guys need a CAT scanner for out there in the desert?" After all, the chances of them needing it for the few days they were in the field--that was another resistance factor that weighed heavily on management. In general, most of them would hate to go to the parent company gunners who came out once or twice a year and say, "We need this for medical." Because it was just another request for something else, and the parent company guys disliked additional requests for expensive "luxuries" in the field, even though Aramco literally carried them when oil financial pressures had the stateside companies in the red.

Hicke: But, you know, I think you really had a major influence here, because not only did you have this marvelous health center in Saudi Arabia, I don't think there are very many oil companies that have this kind of offshore medical facility.

Taylor: Not of that scope. This was--and still is, as a matter of fact, as far as I know--the largest American overseas group in the world. At their peak, there were approximately 8,000 Americans. Now I think there are about 4,000. They were guaranteed, and it was written in their agreement, that we'd provide good medical care. And somebody would say, "What is good medical care?" We would never say Mass. General; we would say it's as good as the average small-town hospital. That was our goal, and I think we met that goal.

I told people, including the doctors that I hired: "You are taking a certain risk, medically, when you go to Saudi Arabia. If you get into an automobile accident and get major injuries, your chances of doing well are certainly not as good as they are where there's a neurosurgeon." You'd think anybody would recognize that, but--. I had people turn down employment over there because

of medical, particularly if they had any kids or somebody with major medical problems. We had no facilities for the disabled like deaf, partially blind, autistic, or some of these things that need ongoing, persistent care. In fact, we would turn down employees who had those kinds of problems, because we knew they wouldn't be able to get along properly without that out there.

We never aspired to be a Mass. General; that was too much for us. We had a rule, which I suspect is still there, a regulation, that any employee--other than the Saudis--could be returned to his country of origin for medical care if it was necessary. And of course, the employees knew this. Now, the question that would come up was: "What is necessary and what is not necessary?" Medical management made that decision. Let's say that an employee had multiple sclerosis, for example; this was one of many such problems. He would say, "Well, I have to go home to have this treated." We would usually arrange to have that done in connection with a vacation, assuming it's not an acute episode at the moment. Chronic problems that could be handled in connection with vacation were usually done that way.

Then we would get the results back, after a workup at some multiple sclerosis center; we usually went to the New York Neurological Center. They would send back a whole program for this employee, which we could follow. Now if we couldn't follow it, if it was too complex for us, then we'd have to say to that person, "Well, you can't stay here, because we're not going to send you home every month to get this thing taken care of. We can't be certain your medical problem will get the care you need, so you will have to return to the U.S.A."

Now let's say somebody turned up with a cancer of the breast, and they needed not only surgery, which we could do there, but they needed x-ray therapy and chemotherapy following the surgery. Then, we'd usually give that patient the choice: you can either have us do part of it and then get additional care in your country or return home and have the entire problem taken care of. Usually patients chose to go home.

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Hicke: We've just been talking about your period as chief surgeon from '61 to '63. Was there anything particularly memorable that happened in those two years?

First Open-Heart Surgery at Aramco

Taylor: Well, I did the first open-heart surgery there, which was interesting, as much less major surgery had been the rule. Arabs had to make do with what we could provide. Neither Aramco nor the government would send them out of the country, as this was their country. Consequently, in some instances we were doing procedures that were a little beyond what we were set up to do. I decided that since there were some serious heart cases around and these patients had serious trouble and were going to die if they didn't have something done, we would see how that went. So I did the first mitral valvotomy, which is a simple, open-heart procedure. It went okay, but it was a major challenge.

One, you need a lot of blood for these procedures and we didn't have a lot of blood. To set up six pints of blood for a procedure was a big deal with us, because it was just hard to get. Secondly, the surgery is simple, but the support that's required to go with big surgery is essential to success. You have to have the right anesthesia. Looking further, you have to have the right equipment to go with open-heart surgery. Further, you must have the right technical people around. We didn't have that. Then what you have to decide is, "Well, is this patient better off taking the risk going with us, or is he better off just going as long as he can without anything?" A very difficult call to make. Temporarily, we decided against major heart and vascular surgery. We really couldn't do it right.

Luckily, the thing got turned around and we could get the Saudi Arabs out for highly specialized procedures. So we didn't have to worry about it anymore. We quit doing surgery which was too big for us. Secondly, the King Faisal Hospital was completed, plus great strides were made in the medical care that the Saudis delivered in other parts of the country, and so they began doing these complicated procedures under Saudi auspices, and it's my understanding they now do them properly.

Hicke: This was in the seventies?

Taylor: Yes.

First Lung Removal

Taylor: I also did the first pneumonectomy, the first lung removal, which was another thing that hadn't been done.

Hicke: Tell me about that.

Taylor: This was a patient with his left lung destroyed by TB. Tuberculosis now rarely requires major lung surgery, but it did then. If diseased lung tissue was not removed, the disease would continue to spread and kill the patient.

There was a lot of TB in Arabia; and even today, I think that TB is the most difficult medical problem Saudi Arabia has to cope with. When Aramco was in the early years, malaria was the major medical problem, but the Preventive Medicine Department under Dick Daggy eliminated malaria in the Eastern Province--a major medical triumph, quite possibly the most important accomplishment of the Aramco Medical Department.

Dr. Daggy probably did more for Arabia healthwise than anybody else, even though he's not a [medical] doctor. He's a Ph.D. and he later become medical director. But that [eliminating malaria] was a major accomplishment.

Evacuation Procedures

Taylor: In the medical business in the seventies, we were trying to delineate how far we should go. With the Americans, if a guy had medical problems beyond our scope, except for acute emergency, we'd send him back to the States. I had identified centers for their specialty expertise; so if a patient had a cancer, we might send him to M.D. Anderson in Texas, one of the highly specialized cancer centers. Or we might send him to Mass General here in Boston. Heart problems would be sent to the Cleveland Clinic, which was the original coronary bypass center. And so on and so forth. Of course, air transportation became much better: it used to take us three days to get by air from there to here; later on, when we had our own plane, we could fly a patient back in less than twenty-four hours.

Another thing that we did that was kind of interesting: we coordinated with KLM [airlines] and we designed and implemented a hospital evacuation setup in KLM jets, which took up eight first-class passenger seats. We had this unit, which they kept, and they evacuated people all over the world with our unit. But whenever we needed it, they would come and pick up a patient. This area in the plane was converted to something like a small intensive care unit: we had IVs, EKGs, and oxygen and all kinds of equipment in it; a medical bed that fit over the first-class seats; and an area for nurses. It was a highly specialized unit

which we developed and improved to evacuate patients over long distances to world medical centers.

We used KLM on many occasions to get acutely ill patients back to the U.S., usually to New York City. That was the nearest place that had multiple major medical centers. We used Presbyterian Hospital, particularly for neurosurgical problems and major orthopedic problems and things of that sort. That was very useful to us for quite a while and obviously a must for patients who needed highly specialized care.

Then when we got our own jet planes, we'd use them. But they weren't as good as KLM, because they were small; these were Gulfstreams with limited space. But you could certainly transport a patient quickly, as we had to wait for KLM. In those days, these evacuation units were on the big jets, these were on DC-8's, plus a part of the agreement was they would come at our request. Because if you had to wait for a scheduled flight in the early days, that might be two days later, and that might be too late. So that was our method of evacuation for the intervening years and saved several lives.

Contract Hospitals--Another Change

Taylor: So that's how things changed. Now the major reason for that was interesting, because at one time we used the local hospitals for a lot of our patients, mostly on a postoperative basis. For example, we'd do a hysterectomy, and then after we'd done the hysterectomy, we'd send them downtown to the local hospital. This wasn't a good relations concept; they didn't like that, because it was an obvious economic decision. The reason was that keeping a bed down there was about fifty dollars a day, and a bed at our place was about three hundred dollars a day. That concept was quickly abandoned for obvious reasons.

Hicke: When you say downtown--

Taylor: That was in Al-Khobar. There were two hospitals down there, run by local people. Joseph Yamine was one of them, director of the Asharq Hospital. Moh'd Ali Ahmed was the other Lebanese running the Asalama Hospital. They provided a service which was expensive but good; so that the local people, many of whom had the money, had a place to go. They had good doctors down there, oddly enough, because they paid well--better than Aramco. They were from the Middle East and did good work.

Hicke: We're talking about the seventies?

Taylor: Yes. Late sixties, seventies--when government health care was still in the developmental phase; they hadn't really gotten into local medicine yet. We would use them as part of our system. Sometimes it was odd, because speaking of specialists, for example, they had an outstanding ear, nose, and throat specialist. So we would send our own patients down there; Americans would go down there if they had something like a ruptured ear drum that had to be fixed. We would use them a little bit, but others living locally would use them a lot.

When the Aramco philosophy changed about what our responsibility really should be, we decided it should be more inclusive than what we had been doing--we no longer sent Aramco patients to Al-Khobar hospitals. This required an increase in our capacity. We took them all in, and that increased the budget significantly. I was not necessarily pushing this concept so much, but management did, because they were getting too much heat on "we go here" and "they go there"; that was beginning to be a major relations problem; so this major shift in hospital policy occurred. And as a result, the budget went up--way up.

Attractions of Life With Aramco

Hicke: Before we continue, tell me what you were just telling me off tape about why you stayed so long. Do you want to put that on tape?

Taylor: Well, I don't mind. Number one, I had the right personality for Arabia: I'm adventuresome; I like excitement; I like to do things; I like to meet exciting people. For example, I took care of the whole Kennedy family, starting with Ted Kennedy, for a week. We had all kinds of unusual surgery. At one point, Secretary Vance was there, Cyrus Vance. Another time we had to bring in the secretary of State under Eisenhower, Dulles, for a medical reason, as explained below.

Just a quick vignette: we had an employee who accidentally killed an Arab. It was a sad situation, because he was driving through Al-Khobar very slowly and carefully, and an older, blind Arab citizen just walked right out in front of his car. He'd barely hit him, but he hit him just enough to knock the man over; so the man fell, hit his head, and died. The rule was, under these circumstances, that the American system had to make a decision: they could either deport that person immediately, so that the employee did not get into the Arab judicial system--but

it had to be done before midnight. So the involved person had that choice, along with Aramco. If the employee decided to take his chances in the local court, he could. But whatever the decision was, that was it. The local people, and I think with justification, would say, "You come to the local court, you must accept the ruling of the local court." This employee, thinking he would win, chose the local court and lost.

So they put him in prison. Nobody ever knew for how long. And going to prison in Saudi Arabia is a dangerous thing to do. So he got very sick, and to make a long story short, if he stayed in prison, he was going to die. There was no question about it. He was dying. So I told Aramco, "If that employee remains in jail, he's going to die." We were seeing him regularly and he'd gotten very bad liver trouble and was deteriorating. So Aramco wanted him out. And so did the royal family; they didn't want some American dying in jail under these circumstances.

But the local governor, Amir Ibn Jaluwi, was a very tough person. I knew him well. Once Amir Ibn Jaluwi, who was almost the original king, made such a decision, nothing could make him change it. Aramco got John Foster Dulles to come to Saudi Arabia to see the king. The king had to get Dulles and Ibn Jaluwi together; and when they got together, there was a major conflict, because Ibn Jaluwi didn't take anything from anybody, including the king. Eventually, some major concessions were made to Ibn Jaluwi that he wanted, and the patient was released. We flew him out. And he survived. I wasn't sure that he was going to make it, even if he did get out. But it just shows you how stringent it was and how difficult it was if you took your chances like that. Very few people ever did that, for obvious reasons.

Hicke: After that, I can believe it.

We were starting to talk about your becoming chief of staff, but I wanted you to tell me why you chose to stay.

Taylor: Those were the kinds of things that kept me around. I enjoyed those kinds of things. As a matter of fact, as I was saying earlier, when you become an expatriate, you really became an expatriate; so all your friends, all your activities, were associated with Aramco. You are separated from U.S. living, and it's a whole new way of life.

I was athletically inclined, and Aramco provided that. They had all kinds of sports events; they had everything you could think of. I was a tennis player of some skill, and I was the Middle East tennis champion for several years. My wife also

played well. We were number one, both of us, in the Middle East. That was a big attraction for us.

Hicke: I recently interviewed Richard Perrine, and he told me to ask you about playing tennis at lunch. For some reason, he said you'd drag him out there and play tennis at lunch.

Taylor: Well, I was number one; and in those days, I was heat resistant. Dick was a very good tennis player, and he would challenge me. If you were challenged, you had the choice of time and place. And so whenever I thought it was going to be tough to win, I'd say, "We're going to play at noon!" Everybody else wanted to play either early or late, but I thought Dick was good enough, so it had be at noon: "Dick, I'll meet you at twelve o'clock down at the courts."

So I had a great time out there. I'll tell you something: if I had it to do over again, I'd do it. When I talk to some of my friends that were here, surgeons, they've had a boring life, as far as I'm concerned. One thing I will say about Arabia, which I consider to be very important: it was never boring.

Hicke: That could be the good news and the bad news.

Taylor: In any event, it was an exciting life, and we met many interesting people. We traveled all over the world, which we enjoyed. Our children were born there and grew up there. Both of them were very prominent in the local scene as kids.

I think that the big dilemma with people was when to leave. Aramco, as I said before, had a backloaded system, and there were significant financial benefits for those who stayed.

Hicke: You did say that, but you didn't tell me on tape.

Taylor: Originally--which was common everywhere--with regard to things like your retirement, you had to stay so long. Originally you had to stay twenty-five years to get a retirement. If you didn't stay for twenty-five years, you didn't get any retirement. So obviously, people were very determined to stay twenty-five years. The employee who killed the Arab, had he left, he would have had to sacrifice his retirement. And he'd been there eighteen years or something like that.

Hicke: So that explains it.

Taylor: So that was why he was so determined to do it. It wasn't that he was obstinate; he just hated to give up a life's work, his retirement. Then later, it became modified as it has in the

States. Now it's portable: you can retire anytime, and you can take along whatever you've got put aside thus far.

But originally, they kept backloading, so that the longer you stayed--and the magic number was twenty-five when I left--in twenty-five years, you got all Aramco had to offer. And in a sense, you didn't get much more after that; you kept it, but it didn't keep going up--which they did on purpose--because at that time, they wanted you to leave. [laughter]

Hicke: Why was that?

Taylor: It was a very interesting thing: originally at the age of sixty, you had to leave--and I mean had to leave. They had it so arranged that nobody--if they could possibly avoid it, and that was most of the time--could be in Arabia sixty plus one days. So you had to leave when you were sixty, on your birthday, or before. You could leave or retire before. But they just had this funny rule that sixty is it. Sometimes the guy would leave, and his wife and kids would still be there packing up! [laughter] I always thought, "Boy, talk about holding the line!"

Hicke: Why? Why did they have this?

Taylor: The reason was many people didn't want to leave, you see. The employees were always trying to figure out some way to stay a little longer and hang around. A lot of people thought that was their world and their life, and so they hated to leave. In fact, some of them actually retired in Saudi Arabia--but not many; I think maybe five out of the whole crowd. But people just kind of hated to go. So they finally made a rule: on your sixtieth birthday, you're either leaving that day or before, and that's it --and there are no more arguments. One of the guys said, "July the sixth is my sixtieth. I gotta be out here on July the fourth." So that's the way that works. As a matter of fact, Perrine, the guy you talked to, was the first employee in Aramco history, after the law changed, who stayed after sixty. It caused a furor. He wouldn't go, and because of the new law he stayed on for two years.

Hicke: He didn't want to go, either; I recall he wanted to finish up his research and publications.

Taylor: It's crazy. You wonder, "Why would anybody want to stay in this crazy world?" It was something. But it was an exciting life. There was a social life out there you couldn't believe. And the social life was fast and furious inside this little compound. The travel that went with it was exciting: every long weekend, people would fly to Bombay, or fly to Cairo, or fly to Beirut. We called

them the DOGS, which was the group that went places, the travel group. If you wanted to go with them, you could go somewhere every long weekend. Many people would go out six times a year. They'd go to Bombay one time, Cairo. Beirut was the favorite place. The Aramco playground.

Beirut was called the Aramco playground for good reason. It was some playground! We used to love it, because a lot of the women who worked in the shows, particularly in Paris, would come down there and be in the--they had a famous gambling place--the Lebanese casino. They had the marvelous shows. But those girls didn't seem to have something to do all the time, so they were downtown a lot and certainly improved the scenery in Beirut.

Hicke: That's why it's known as the Paris of the Middle East.

Taylor: That's right. It had a charm about it that you had to like. Not only lovely ladies, but high-style clothes, marvelous clubs, swimming in the Med, skiing in the Cedars--a sophisticated society.

However, some employees could not adjust to desert life. We had one doctor come out, I'll never forget, who was a New Yorker. He loved New York and he went to the clubs. And he was a chess player. He loved playing in the chess club tournaments. He came to me one day; he said, "I've got to go home next month in December." I said, "Why is that?" He said, "The chess tournament is on. I play every year." I said, "But you've only been here six months. You can't go home." He said, "I have to go! I'm going!" I said, "Oh? Well, if you go, I think you'll have a lot of time to play, because you won't be coming back." We had a big fight about it. Actually, he could have played in Dhahran; we had two "master" chess players.

As a matter of fact, I finally arranged it so that he could go. And he did go. But I told him, "Don't do it again--because this is the only time." But he couldn't stand it out there. He quit. It was just not enough for him, you know. He just couldn't enjoy himself. It was a place which appealed to me; it didn't appeal to him. You had to like it. A lot of people stayed, many left. Interestingly enough, the compensation for doctors was never quite good enough, never irresistible. They put us in a category with the engineers, pay-wise. But the category for other groups--like nurses, teachers, techs--was almost always comparatively much better an incentive to stay: "Whatever you're making now, we'll double it." That was the standard criteria. So we'd get a nurse who was making, let's say in those days, \$20,000 a year here in the U.S., and she'd get \$40,000 with Aramco.

Hicke: Why wouldn't they do that for doctors?

Taylor: They thought engineers were top guys. They were all engineers. They were going to put doctors in with engineers; the truth of the matter was, in those days, doctors were in a higher income level than engineers back here. But that was another thing we could never get together on either. As a result, Aramco had great difficulty in recruiting and keeping high-quality physicians.

Hicke: They didn't quite figure that out.

Taylor: However, Aramco had many redeeming factors. We used to call Aramco "Mother Aramco." One of our top employees went to India and got acute amebiasis and almost died. We got our plane out, flew over to some little place in India, picked this employee up in our little Convair, and flew him back to Arabia and took care of him. He was over there on a vacation. So Aramco would do whatever it took to take care of its people. It was a paternalistic attitude that a lot of people liked.

I was just having a good time. Then I'd come home and talk to my friends; and I'd think, "These guys are having a boring life." So I wouldn't quit. My wife regretted it, because I did pass up a couple of nice opportunities. But that's why I stayed all that time.

It would almost appear that Aramco had a sixth sense about this, because every time I'd pretty much made up my mind to leave --I had a great offer from Stanford, out in Palo Alto. Somehow, you think somebody'd let them in on it, because I came back and they said, "We know you're thinking about leaving. But we've got some nice things to talk to you about. You know that house you've always wanted that Frank Jungers--he's the president--used to live in? Well, we think we can get that for you. It has a pool in it, and we'll fix that up for you. Of course, it's time for your raise, but you've done such a great job, you're going to get a lot more than usual."

One year they sent me to the tennis tournament in France on the Riviera. They said, "It'll be good publicity for Aramco." I said, "Absolutely!" So my wife and I and two other people went from Aramco, and played in the French Riviera tournament. They did little things like that, and I thought, "Why should I ever leave?" So then I'd go in for another two years.

Hicke: So you signed up in two-year increments?

Taylor: Yes, the contracts were for two years.

Hicke: They'd make an offer you just couldn't resist.

Taylor: Yes, an offer I couldn't resist. It was exciting, I must say, and I still say, there are no other opportunities like this.

My wife, if she were here, she'd probably say we stayed too long. In the later years there, my kids were in college, and then they didn't want to come anymore, because to them it was boring. And a lot of our friends had left, retired and gone. Our little social group was breaking up. Even I got so I thought, "Well, it's certainly lost a lot of its luster; the same old crowd isn't around; not having as much fun anymore."

So finally I quit at twenty-five [years of service]. Even then, it was hard to do. I always said, "That letter I had to carry up the hill (to say that I was leaving) was the heaviest letter I ever carried." Because I really left reluctantly, and at considerable cost to me financially. I left at fifty-five. If I had stayed until sixty, it would've amounted to considerably more income at the end. But in looking back, we had done it--there was no doubt about it. When you say, "There's no place left on earth I want to go, my kids are back in the States, and my wife is fed up with the place," you've got to start taking it seriously whether you want to stay or not. So that's why we finally packed it up and left for good.

Chief of Staff, Clinical Services, 1963-1968

Hicke: Going back to 1963, they persuaded you again to stay, and you were chief of staff from 1963-1968. What were your responsibilities?

Taylor: Chief of staff was the job where I was responsible for all of clinical medicine. I was over not only surgery, but the medical department, the OB/GYN department, the dental.

Dental Care

Hicke: Can you tell me more about the dental service?

Taylor: Dental is worth touching on for a moment, because the dental service was something that they definitely did do right. The dental caught the fancy of management more than the medical.

Hicke: They needed it?

Taylor: I think it was mostly because all their kids needed their teeth straightened. Anyway, we had a beautiful, big dental clinic there. As I told you, it went from one dentist when I first went there, to fifty dentists when I left. So in Ras Tanura and Abqaiq, there were two or three dentists in each place. The big center was in Dhahran. We had orthodontia, endodontia, oral surgery--we had complete coverage. They were highly subspecialized, so they provided a superb dental service.

In the end, when we rebuilt the hospital we built a new dental clinic that must have been the best dental clinic outside the United States in the world. If you went in there, it was absolutely astounding. And this was all due to [Bernard] Bernie Eggerman, because Eggerman was a superb dentist, and he had imagination; he had creativity. He created this clinic; it was round, with offices coming off of the center, administration was in the middle, and everything related to dental service you could think of was in there.

Originally, we would only provide Saudis with emergency dental work. But then as the years went by, we kept giving them more and more of the dental work, and that enlarged the system. The dental educators taught preventive dentistry to the Arabs, as far as how to take care of their teeth. So that was part of their job, and the dental work grew and grew.

But I have to give 95 percent of the credit to Eggerman, and the other 5 was me driving it through management. I have to give him credit, because not only could he visualize it, but he could convey this to other people as a really great idea. So that's why the dental program was good. He was there; he was the kingpin of it--as versus the medical, where people were moving around more and not concentrating on one area.

Hicke: So you had Outpatient Service, Medicine, OB/GYN, Surgery, Pediatrics, Radiology, Laboratory.

Taylor: Yes. They all came under chief of staff. As I told you, the outpatient load was huge. That was a big system, so that in itself was a major undertaking. Not as glamorous as inpatient work, but very demanding because of its size and being spread over such a large area.

Administrative Matters

Hicke: How much of your time did you spend on administration?

Taylor: I would say, in that job, about 50 percent, which wasn't what my bosses would have liked. It was funny, because I turned the job down once because they said, "No more surgery." Well, in those days, I was thinking, "I'm not going to stay here forever. I'm going to go back and do surgery, so I'm not going to quit doing surgery." So I turned the job down. The guy who got the job, we didn't get along too well, and I said, "That's not going to happen again." He left. They offered me the job again and said, "No surgery." And I said, "Well, I'll keep it to an absolute minimum," and I took the job.

Hicke: Who would you be reporting to in management?

Taylor: As chief of staff, I reported to the medical director. The medical director was over everything medical.

Hicke: And who was the medical director?

Taylor: Well, the medical directors were: Robert Page; then Dick Daggy; then Dick Handschin after Dick Daggy.

Hicke: I hope to talk to him, too.

Taylor: Dick Handschin became the director after Dick Daggy, and I was his backup, chief of clinical medicine; I was also the assistant medical director. I was right behind him. He had to leave for personal reasons, reluctantly. This was unfortunate for him and for Aramco; he was a dedicated, competent director.

Medical Director, 1968-1978

Taylor: This is a funny little story you'll get a kick out of. When he left, I had just automatically assumed that I was going to step right into that job. They called me up and they said, "Come on up. We're going to have a meeting about the medical director." And in my naivete, I completely expected for them to say, "And Dr. Taylor, you will be it." So I get up there, and they start to talk about it: "Who will we make medical director? Should we bring in somebody from the outside?" Out there it was very fashionable to bring in someone from the U.S., not infrequently someone that was no longer needed in a parent company.

At that time, Bob Brougham was president. I happened to be sitting next to him, because I thought he was going to say to me, "And Dr. Taylor, you're the next medical director."

So this selection concept was going on--"Maybe we should take this guy in; maybe we should get a lay administrator"--and that went on for about half an hour. I got out a piece of paper and I wrote a little note to Brougham, who was sitting there: "If I'm not medical director when I walk out this door, you can get somebody for my job as well as medical director." I meant it. I handed it to him. He looked at it and said, "This meeting is temporarily discontinued. Everybody except Taylor leave," so about six guys got up and left.

He said, "Why do you want to be medical director?" I said, "Are you kidding? Do you think I've been out here all this time and I don't want to be director? I've been in this system for--" whatever it was--"fifteen years." He said, "But I thought you wanted to be in medicine and all that." I said, "I do, and I will still continue to do about as much as I'm doing as medical director." He said, "You can't do that. The job is not like that." I said, "Take it or leave it." I meant it. And he said, "You're the medical director." He called everybody back in: "I just made a decision. Dr. Taylor will be the next medical director." So that's how I became medical director by popular choice.

My boss was a guy named George Larsen. We were walking away, and he said, "What happened in there?" I said, "George, you'll never know." But I would've left, because it was one of those face-saving things, you know. Everybody, including me, thought I was going to be the medical director. For them to start talking about people that had absolutely no ability to do this job was more than even I could stand. As easygoing as I am, I wasn't going to take that one.

Hicke: They clearly thought you didn't want it.

Taylor: Well, later I said to Brougham, "Bob"--Bob was a guy I knew; he'd came up from Down Under; he wasn't originally destined to be, but he was a goer--"a guy like you should understand that a guy like me is not going to let that happen. It just can't happen." Because he said again, "What did you want to do that for? You have to fool around with all these kinds of problems that have nothing to do with medicine." I said, "That's okay. I'll accept that" because it was financially very rewarding, and I was always happy about that. So that's how that happened. I became the medical director.

Just to finish up that part of it, I was medical director for approximately ten years. Other guys were moving up. I've forgotten which president was in. I said, "It's time for me to be on the board. I've been here long enough to be on the board and I've got one of the biggest budgets in town." In fact, I had the second biggest budget in the company. They wouldn't call me a vice president; that was too much for them. They said, "No, we can't make you a vice president. We're going to make you the executive director of the Aramco Medical Department," I think that's what it turned out to be. There were fourteen men on the board, as I remember, and I was the fourteenth.

Hicke: Everybody else was operations?

Taylor: They were, right, as a matter of fact. They only did it because I was insistent and a good friend to most of them. There was no administrative reason, in a way, but at the same time I was over a larger budget and had far more employees than several other vice presidents.

Hicke: Well, were there budgetary considerations?

Taylor: Not really, because they didn't think in terms of money. It was more important to know where they were going to drill another wild cat well out in the desert than whether the hospital opened or closed. We didn't really have anything to do with the real oil business, so I could see their point. But that wasn't good enough for me. The thing I liked about it most--one of the reasons I was so persistent--was one had access to the airplane. If nobody else was using the plane, you could take the plane. So finally Brougham said, "We'll just give you the plane." [laughter] I'd come up there to ask that pretty often, "I'd like to have the Gulfstream this week. Is anybody taking it?" Brougham finally said, "You're overdoing it." I guess one time while I was gone, some important Arab wanted to go somewhere in the damn plane. "Where's the plane?" Well, anyway, in those last few years, I did have fun.

Hicke: Where did you go?

Taylor: Well, that time I was in Rawalpindi, which was the capital of Pakistan. Then I flew to Bombay; I flew up to Iraq sometimes. We went up to Iraq to look at the hospital when we were thinking about hiring Iraqi nurses. It was a long weekend so we went on to Beirut; that was our favorite place to go. That's what happened toward the end of my career out there; however, I felt that I deserved the post, given the size and scope of the Medical Department and what we accomplished for Saudi Arabia and Aramco.

More on Contract Hospitals

Hicke: Okay, let's go back. I want to ask you a little more about the contract hospitals. You alluded to them before, but I'd like to ask you to describe these in full.

Taylor: Those were the Asharq and the Asalama Hospitals. They were both underwritten, in a sense, by Aramco--in the sense that we guaranteed them so many beds. So they got a steady income from us, and then we sent certain patients to them. That made good sense, because when those were started, not only did they take care of our patients, but they definitely provided a higher level of medical service to everybody in that area. There were a lot of people in that area who couldn't use Aramco, like Lockheed, the military, all kinds of other American companies. They all used those contract hospitals. Indirectly, we convinced the managers of those hospitals that they had to have good staff and maintain a good reputation.

We gave them a lot of support. For example, we would provide blood for them if they needed it. We'd provide advanced laboratory services, advanced x-ray services; in other words, their patients--all of their patients--could come up and use our support facilities. They didn't overdo that, because we would charge them, you see, so they wouldn't send anybody up that didn't need say, a GI series or something like this. So we worked in coordination with them to assure a reasonably high quality of care for our patients and their local clientele.

That did three good things: one, it provided a much better level of care to the local area; two, we shifted a lot of our inpatient load off to them, which was quite acceptable; and three, it took away the onus on us to provide medical care for everybody, because they did a large part of the outside work we were originally doing before. It was a very desirable concept at that time; the managers did a good job and made a good profit. They were responsible to me. We were down there all the time, seeing our patients; and if the care was inappropriate for our patients, and we didn't think it should have been, we'd definitely have a meeting about that. So we helped them provide good medical care for the benefit of all concerned.

Hicke: When did you get this started?

Taylor: Good question. It was well after I became chief of Clinical Services, so it must have been around 1963, somewhere in there.

Hicke: And can you tell me what it took to get this going?

Taylor: The original hospital was the Asharq Hospital managed by Dr. Joe Yamine and Dr. Afif Wahab, both Lebanese doctors who came to Al-Khobar to open a private hospital. I knew Joe pretty well. He did not do medicine himself but did want to run a good hospital and provide an appropriate quality of care. Dr. Yamine of the Asharq Hospital was the first partner. And then Ali Ahmed, who was previously an engineer with Aramco, saw this as a money-making proposition. So he got the second hospital going. That was good because they competed, and that kept them both at good levels.

Another thing was that they employed Arab nationalities. Almost all of their doctors were of Arab origin. Many of them were Beirut citizens, several Palestinians, and Egyptians. In those days, that was good. There was a solidarity behind that group of people, and they were all very pro-Arab, and so it was very well received. In the interval before the government really got their system going, they were a great fill-in, to fill in that gap. If you have a big company like Lockheed, they have to be able to say with some assurance that there's pretty good medical care around. Otherwise, people are very nervous about living out there.

Hicke: What were they doing before?

Taylor: Lockheed?

Hicke: Yes.

Taylor: They just got started then.

Hicke: But Bechtel had been there.

Taylor: Bechtel used us. Bechtel and Aramco were very close. Steve Bechtel, who was a patient of mine, had a very close organization. They're still doing things out there in a big way. Fluor also had a deal with us that we'd provide medical care. However, with Bechtel and Fluor combined, they only made a few medical visits per year.

Hicke: How large were these contract hospitals?

Taylor: I think each one had 110 beds, plus all the outpatient services; in other words, they had a big outpatient unit and they'd see anybody. But they were pay as you go. You paid as you came through the door, unless you were Aramco; in this case we paid. Each one of them had an operating room, they had straightforward x-ray equipment, and they had modest labs. But each one of those was done well. What they did at their level was done well. And they too, under our insistence--certainly for our patients--had to

keep good records so we'd know what was going on. They delivered good medical care.

Hicke: How often would you go to visit these hospitals?

Taylor: Probably on average every two weeks we'd do an inspection, where we'd go down to see how things were. I knew both of these managers well, and I made sure they understood in a nice way that the standards had to be there, because all we needed was have some unfortunate medical results and there'd be big trouble with the whole concept--which they recognized in the end, would be big trouble for them.

Hicke: These were for-profit hospitals?

Taylor: Oh yes.

Hicke: And were they profitable?

Taylor: Absolutely. That was a big conflict. It's just like today: it's very hard now for a hospital to be profitable. You have to cut corners; you have to watch out not to cut the wrong corners. But that was why we were going down there all the time to inspect them. Even then, it wasn't all we would like, but it was close enough to work. They were always short-staffed; it was hard to keep staff; it was difficult to run a decent hospital in that area.

Hicke: Did they have enough electricity and water and all those things?

Taylor: Yes, they did. That was a side effect of Aramco, because we kept Al-Khobar, where there were a lot of employees living, hooked into the water system. The telephone system looked like a spider web; there were about eight million telephone lines, because every telephone had a single wire coming from the base unit to that telephone. So you look at these telephone poles, and you could almost tell the state of progress of the country. Originally, there'd be about five lines; and when we left, there were about five thousand lines on this same telephone pole.

Phones were a luxury. You had to wait a year to get a phone. The local Americans who worked down there, that could drive them crazy. So that was one of the drawbacks. Anytime those companies had a serious problem medically, we'd take care of it. You also had a big military base there for a while, 25,000 airmen, and we were very closely associated with them medically. They had a hospital--it was a nice building--but they didn't have any surgeons. The guys who'd cycle through there were young M.D.s right out of school, you know. So we helped out a lot. Luckily

they were a healthy bunch of guys. Usually an accident or something would be their major medical concerns.

Hicke: There weren't any dependents?

Taylor: Very few. Some of the very high-ranking officers had family, but there probably weren't more than twenty dependents in the whole place. In the American Consulate, you had just another small group of Americans.

Hicke: Where was that?

Taylor: The consulate was between us and the air base, about five miles away. We needed them and they needed us, and we worked very closely together. We'd take care of any major medical problems they had, but there was only the consul general and his wife and occasionally his family and the marines who took care of the consulate.

Medical Care for the King and Royal Family

Taylor: The other group we took care of was the royal family. We had a steady flow of those people. King Saud ibn 'Abd al 'Aziz was the ruler when we got there--he used us a lot. He had great faith in us, and he'd come over for all kinds of medical problems. We saw him a lot; I personally saw him many times. Any of the royal family, which was big, could come, but they didn't like to come because they wanted to go out--just to go out. So they'd use London, and they still do. If it was an emergency, they'd come and see us. It mainly depended on the level of their closeness to the king, too, because the extent of the royal family is unknown. I don't know how many there are that can legitimately claim to be part of the royal family, but it numbers in the thousands. Once they came and were approved by our Government Relations people, we took care of them--whatever level they were. It didn't matter to us.

But when the king came, that was always a big occasion, because he'd come in an take up about half a ward. Phil Gelpi was his main physician. Did he ever tell you about that?

Hicke: Yes, he told me a little bit about that.

Taylor: Oh, those were trying days. Phil and I were responsible for the king's care, but were not fully appreciated by the king or Aramco.

Hicke: Wasn't he the one who was eventually deposed?

Taylor: Yes.

Taking care of King Saud ibn 'Abd al 'Aziz was an adventure of its own. We went over two or three times, and we'd go into the palace. First time, it was like two in the morning. Our Government Relations guy just called up and said, "Come down and get on the airplane." I said, "Just a minute." At that time I'm thinking I'm a wheel, you know, and I said, "What do you mean come down? What for?" He said, "We're not discussing it. Just come down."

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Taylor: So I got Phil Gelpi, who was the chief of Medicine, and the two of us went down and got in this plane; we still didn't know what it was all about. It was like cloak-and-dagger stuff. We got over there; it was about three in the morning, dark. We got out and there were three big, black Cadillacs lined up; so we got in one of them with a guy named Ron Metz, who was our contact in Riyadh. He was acting like it was top secret, confidential, you know. Another guy that was there was Sheikh Eed Ibn Salim, who was the king's top confidant. So we rushed over and here's the king lying in this truly king-size bed. We were duly impressed. [laughter] The bed, I swear to God, was almost as big as this room. We came in; we couldn't even get close to him to examine him, he was in the middle of this bed.

He's looking sad, because he's been throwing up this blood-- and there was lots of it. So we immediately began looking sad, because we knew that we had a real problem on our hands. Sheikh Eed was a very tough Arab; he said, "This is not going to happen, you know. You guys do whatever." So then when we started telling him what had to be done, the king kept saying, "No. No!" He was not going to do this, not going to do that, couldn't take any blood; he was not what you call the ideal patient, to say the least.

So finally we said to Ron Metz, "You tell Sheikh Eed, who's siding with the king on everything, that if he wants the king to be around here tomorrow, he'd better do what we say; he'd better do it now!" I got tough. I said, "If anything goes wrong here, you make it clear to him it's his responsibility and he's the one who's going to be held responsible." Sheikh Eed didn't like that; nobody talked to him like that. I said, "That's the way it's got to be." And I said, "Ron, you're representing Aramco. You better make sure it gets done, or else you'll be in the hot seat."

Finally--I've forgotten how long it was; too long for us--he finally agreed. We got him on the plane with all these people. Every time a plane takes off, everybody tries to get on it. So we were out there fighting them off. We flew back over [to Dhahran] and got him into Aramco, and finally got him medically stabilized. But we had all kinds of consultants from all over the world, mostly from the U.S., and they were looking at him. It was some deal. He didn't want to leave; he wanted to get it settled right there. In the long run, Dr. Francis Moore, chief surgeon of Brigham Hospital in Boston, who's a good friend of mine, came over and took over.

There was a funny vignette: I sent for Franny Moore, and this guy shows up from Germany! I thought, "Well, what's Franny Moore doing in Germany?" I went down. There was a guy whose name was Franny Moore. It wasn't Franny Moore from the U.S. [laughter] In the communications system, somebody found a Dr. Mohr in Germany, who was big in tropical medicine. But that wasn't what this problem was. So I went down and he was there, and I said, "Why are you here?" He said, "They sent for me. I'm here to save the king." "Oh," I said, "well, that's good to hear. I hate to say this, but you're not the Franny Moore we sent for." "What?" he replied. Oh, he was indignant. And he hung around the whole time.

Hicke: Trying to save the king?

Taylor: It turns out he was a world authority on tropical medicine, but that wasn't the king's problem. And then when Dr. Francis Moore finally showed up, we introduced them. They had a great time together. They stayed up into the wee hours talking together. That's only the abbreviated scene, but that was a frenetic occurrence, I'll tell you! Then under Dr. Moore's direction, it was decided to move King Ibn Saud to the Brigham Hospital in Boston.

I'll never forget: they got a TWA 747 ready. But the king did not want to seem like he was sick. So we put him in a big chair in his hospital room. We brought up a huge trailer and put the chair on it and they wheeled him out. Then we lifted him up into a truck with a forklift and put him up in this truck in his Aramco-made throne, and he was sitting in this truck like this. [indicates position] He waved to his citizens as he was taken down to the TWA jet for Boston.

Hicke: You indicate he was leaning back, with his head back, barely surviving.

Taylor: Yes, but he had so many clothes on no one could really see how he was. I'll never forget it as long as I live. We got down to the plane, and they had another forklift down there, and they lifted this whole platform with lights up to the plane door. Then the problem was getting some people to get him out of that damn chair in through the plane door. The rest of us were climbing up the steps, and we had to haul him out of that chair. He was trying to walk, you know, like there was nothing wrong with him, all these people were cheering, and he made one last feeble wave to the crowd.

We finally got him through the door, whereupon he promptly fell into the bed we had arranged for him. And then all these people got on I was telling you about--they filled up the plane. I didn't go with him; I wish I had. They took off for Boston. I could have gone. I missed that one. I don't know what I was thinking about, because that was a spectacular trip. Franny Moore went with them, and he wrote a paper about it. He wrote it up.

It was certainly one of the most spectacular medical evacuations in all history, I'll tell you that. They got there and they rebuilt the king. I'll give him credit that he came to the right place. He had many little things wrong with him as well as major things: he had a hernia; he had problems with his eyes--he couldn't see very well. So that was that. It was quite a scene. He was finally in decent medical condition and returned to Saudi Arabia.

He finally stepped down because of ill health and King Faisal ascended to the throne.

Early Saudi Medical Practices

Hicke: We have about an hour to cover your last years--and there's a lot to cover there--but I also wanted to ask you if you could tell me a little bit about the Saudi medical practices as they were before the advent of Aramco, so we can see how things have changed.

Taylor: There were two major phases. When we first got there, they were still in an era where there was something like a local medical person in the community, who really wasn't a doctor, but somebody who was interested in and carried out medical activities. When we first got there, one thing that the Arabs did learn fairly quickly and easily that antibiotics are good. So when anybody had an infection, the local people would give them antibiotics.

Before that there were mostly what you and I would say was on very practical first-aid basis. They did still have some outdated practices: for example, one thing they used was cautery. The objective of cautery, which is not quite as bad as it sounds, if someone was having pain, the local medic would cauterize some part of the body with a little cautery coin, almost like a nickel. This would burn the area and leave a scar. We got so we could diagnose abdominal TB because they'd have these little burn marks on their abdomen, and that was always because they had abdominal TB. TB would hurt, they'd apply the cautery and relieve the pain, an ancient but effective remedy.

I'm trying to think of other things. Until the advent of antibiotics, it was pretty low level--first aid and splints. In fact, they used to harden splints with camel dung, which is very interesting; they'd take soft camel dung and put a splint on a broken leg, and wrap it in muslin. That would harden and hold it in place. It worked surprisingly well.

Hicke: What about herbal medicines?

Taylor: They used herbal medicines and things like bark. I remember they used the bark of some tree for something. Anyhow, according to them, it worked; so who were we to argue?

When Aramco and these local hospitals had gotten there--in 1962, '63--then they suddenly went into the next phase of medical practice. They began to get in real doctors, who had been to medical school and trained. Some of them were very competent. Mostly, they would come from Cairo--the University of Alexandria and the American University of Cairo. Some of them were Egyptians; some Palestinians came down; doctors from Beirut came down.

And then Saudi Arabia started training doctors. They started their medical school, which I think was around 1970 in Riyadh; I'm just guessing, but it was somewhere in that era. But of course, they had four years of medical school before they graduated. They eventually began graduating doctors, and then they came into our system and went all over the country. We had two forms. In the government hospitals, the doctors were paid by the government. And the pay was not exceptional, I'll say that, to say the least. A lot of the doctors had an obligatory time to put in, and they would assign them to various parts of the country; so they got to stay in that area until they'd finish their time, which would be two to four years.

Hicke: It's in response to the education benefits?

Taylor: Yes, as a reward for being trained and being paid for, they had to put in their time taking care of the population. After that, most of them would try to get into a situation where they could make money at the same time--not unlike we do here. They'd concentrate in the populated areas, in particular in the populated areas where people had the money to pay. Other than these two hospitals in Khobar that I was telling you about, there was one over in Jiddah --there were some Americans working over there as well as local people--and then in Riyadh, there was a private hospital, but it was hard-pressed to get doctors and keep up.

Then the Arab government had one of its meetings and said, "What do we need to do? Shall we build a railroad or shipping fleet?" They decided to build the King Faisal Hospital as a grand and rewarding project. And they did. They built the fabulous King Faisal Hospital, which was extremely well done. It's a handsome building. They decided to make it the most modern hospital in the world--not just in Arabia, not just in the Middle East, but in the world. They put everything in that hospital that you could think of in the way of monitors, computer systems and equipment. They had all kinds of modern x-ray equipment, as modern as you could get in those days. I'll never forget: they treated burns there, and they had a sand bed they put them on, so they wouldn't irritate the skin. The very latest thing in hospitals.

We collaborated. It was managed by Hospital Corporation of America, which was in Nashville, Tennessee. Their approach was to get well-known chiefs of services, more or less, from the United States to come and run these big services. I remember they had the retired chief of surgery from the University of Oregon, for example. And they had another retired medical chief from Vanderbilt. So they would look around, and with some success, they would get very high-level people to come and monitor and manage their respective services at the King Faisal Hospital.

Originally--and still is, as far as I know--it was open to anybody. Anybody. If they came from China, they could come there. It was a big hospital: I think it was 300 beds. When I left, they were planning another 100 beds and it is now up to 500 beds. It's extensive; it takes up several blocks. They had their own nursing school there, but they imported most of the nurses. Arab women were slow to get into nursing; it was not regarded as a high-level profession by Arab families--still isn't--so nobody encouraged their daughters to become nurses. Nurses were imported from India, Philippines, and so forth--from outside the country to do the nursing; large numbers were required the man the twenty-four-hour shifts. They had x-ray therapy and cancer therapy before Aramco. Now Aramco's gone into that, but we didn't have it

then. They were the only center in that area that did that kind of advanced treatment for cancer. So that's what happened as far as medical progress was concerned in Saudi Arabia.

How did we help? For example, we set up an entire pay scale for the staff. We set up a benefits plan, a contract schedule--how long they should come for, how much vacation. That made it easy for them from that viewpoint. We met with their management team on numerous occasions to assist. I went into the OR [operating room] and looked at things and told them how I thought they should equip these areas, arranging OR location more satisfactorily and so on. We had a little bit to do with the actual construction in certain areas of the hospital.

Then, a big company from California, which you may know, came into the Arabian Hospital system. They took over hospitals on the west coast, of which there were three: one down south of Jiddah, one in Jiddah, and one up in Yanbu. These were three hospitals which were originally built as military hospitals, but they took them over and converted them into good hospitals. So there was a little chain over on the west coast that took care of that area, and they were quite good.

There were a few private doctors around, like a couple of Americans in Jiddah and Riyadh, but you had to be a certain personality type to do that. It was one thing to live in Aramco inside the compound; it was another thing to live in Arabia outside the compound: two entirely different worlds.

Preventive Medicine and Research

Hicke: Now during your time as medical director, what were some of the most important things that happened?

Taylor: Well, as I said before, in the clinics, we were training people clinically, mostly with hands-on: we'd walk around the wards and I'd make rounds; we'd have four or five doctors and four or five students, just like they do here. In the training arena, like in the OR, if a new surgeon came--I remember when a new Saudi surgeon came, he had to operate with one of our senior surgeons for a year, in the big cases, until we approved him. They do that here; that's standard practice. So as far as clinical medicine was concerned, it was a routine very similar, as I said before, to what we do here.

However, we made some big strides in training clinicians. Public health and preventive medicine was done by Robert Oertley. He was a man of the Arabs: he loved to go out and stay with the Arabs. He'd stay out in their camps with them and travel on the desert. He spent a lot of time out there, and really knew what their problems were.

One of the things that we did was the trachoma research project. That was set up with Dean [John] Snyder of Harvard. I don't know whether you're ever going to see him or not. Further, the Aramco part of the research was headed up by Roger Nichols.

Hicke: Dr. Snyder sent us part of the memoir he's writing.

Taylor: In a nutshell, what they were trying to do was to develop a vaccine against trachoma, because trachoma was making a lot of Arabs blind. It's the leading cause of blindness in the world--trachoma. What Harvard hoped to do was to make a vaccine that they'd give youngsters and prevent them from getting trachoma. So we spent a lot of time and money working with Harvard--in fact, I think that research is still going on. Roger Nichols spent all of his time on this trachoma project. Unfortunately, it was very, very hard to make a vaccine against trachoma, because it behaves like a cold virus. Even though you can give a trachoma antigen, the antibodies' resistance buildup only lasts for a little while--maybe six months--and then it disappears, like a cold. And then if you're exposed to the trachoma organism again, you get reinfected. Nonetheless, they worked long and hard at it, but even today, I would doubt that they'll ever succeed, because of the short life of the antibodies.

The other thing they found out which was very interesting: the people in all those houses I told you about that we built, the people in those houses never got trachoma. What they found out in this research project was that there was a direct relationship between the availability of water and the incidences of trachoma. The more water you have to wash with and keep clean with, the less trachoma you have. One time I seriously proposed that instead of spending all this money on the trachoma research, we should put water systems into these areas and we'd knock out trachoma. That happened, but by accident, not planning.

We did a lot of work on TB, which was equally difficult and not very rewarding. We tried to educate them and we treated the local TB cases. But TB had a stigma. Even though they knew they had TB, they wouldn't come in. It has a stigma here [in the U.S.], by the way. It's stigmatized because TB is regarded as a disease that goes along with poverty; and as a matter of fact, it is more common in people and areas where the hygienic levels are

low. So we couldn't make much headway there. It was hard to educate them and it was hard to treat them. They'd often come in very late; and sometimes it was too late. We worked hard at TB, but we finally got so that we treated it the best we could and that was it.

One time we had a cholera epidemic, which we played a big part in, which Oertley headed up for Aramco. I think we helped immunize something like 200,000 Arabs with a cholera vaccine that we had flown in. That was a big effort. After that, we kept kind of an ongoing cholera vaccine presence: if any cholera showed up anywhere, we'd move into the area and vaccinate the contacts. Since then, the cholera vaccine has lost its support; it hasn't worked very well and is rarely recommended.

But all the Arab employees were vaccinated with the standard vaccinations of that era. This included tetanus, diphtheria, measles, mumps, and German measles--all the routine vaccines. Once or twice when we thought we had a typhoid outbreak, we vaccinated the involved people. So we had a public health program that would protect everybody that we could.

We did those kinds of programs. Then another interesting thing that we did which is worth noting--and you'll get more of this probably, so I won't take too long--originally, when we first went, they used nightsoil, which is human excreta to fertilize all the local produce fields--tomatoes, lettuce.

It was very difficult to persuade the Arabs to switch to chemical fertilizer, because they'd been doing this other for centuries, literally. But the nightsoil caused everybody to have worms. So that ascaris, big worms, were very common. It was one of our common operations, where we'd explore usually older kids--and I won't discuss it because it'll ruin your lunch--and take out literally pans full of worms. We used to call it the spaghetti lunch. These worms would frequently cause intestinal obstruction.

In order to sell chemical/urea fertilizer, Aramco would go out to a farmer and say--Aramco had contracts with certain local farmers to use their produce, but the agreement was that they had to grow it like Aramco said, no nightsoil. But they were still using this nightsoil, because they would also sell this produce elsewhere. So Aramco went out and actually marked off certain areas in each farm and fertilized that area with urea fertilizer. And they had to put guards out there, because the funny part about it was that the farmers would come and in spite of all the positive evidence, they'd want to do their thing. So they had that part marked off and fenced off. Then Aramco proved without

any shadow of a doubt how superior the synthetic fertilizer was to nightsoil.

After that, they went to the four-crop season, which they couldn't do before. They would raise four crops of tomatoes, four crops of lettuce. So they greatly increased the produce volume. That was an indirect health measure, but in due time, it greatly reduced the number of patients who came in with worms and other types of intestinal parasites that they got from this human fertilizer. So it was a huge step in the right direction.

Hicke: I see all along here this theme of preventive medicine, which was a crucial factor.

Taylor: Well, I never was as big as I should have been on preventive medicine. But there's no doubt about it: if I were going to write a thesis on preventive medicine, I'd go there, because it's demonstrated how much good it did. In addition, we cleaned up their water supplies; we put in sewers. When we were putting in these new Arab housing units, they had sewers. And then we let the other people hook into the sewers. Before that, they'd just go out to the streams, you know, and that was it. Still do, probably in many parts, but that contaminated everything, because their stool would drain into these waterways which people were drinking from. It was a vicious circle.

That was never fully accomplished; when I left, they were still trying to get the sewer into Hofuf, because the people resisted it. People didn't know: "Why do we have to have that?" So those were some of the major health efforts. If you get to Oertley, if you want, he'll clarify all these efforts.

And we did a lot of preventive dental, which helped their teeth. We put fluoride on their teeth and gave them lessons in how to take care of their teeth.

At one point, we brought in the pill for birth control. There was a lot of controversy about that even amongst our own people.

Hicke: Americans or Arabs?

Taylor: Birth control pill for the Arabs. Oh, the Americans were already doing it. Well, the Arabs found out about this and learned what was going on. So the Arab women who came to these classes said, "We want to take the pill." Because it wasn't uncommon for one woman to have ten, twelve pregnancies. It was easy to understand why they'd want the pill. That was very interesting, because we

started giving them pills with no advertising because we anticipated religious resistance.

The local Qadhi, who were the religious leaders, found out about it. They came up and said, "You can't do that. That's against the Koran." Well, it isn't written in the Koran. But anyway, they objected, so we stopped. Now this will give you an indication of the power of the women in Arabia. These women raised so much trouble about that, that the religious leaders reversed themselves and allowed the women to have the pill. We were trying to change the society about excessive pregnancies, because for one woman to have twelve, fourteen pregnancies is just not a healthy thing. Overpopulation is not a problem there, but at the same time, to have one man with three wives and thirty children--that doesn't make sense somehow. But the Qadhi didn't like it, and they yielded reluctantly. The only reason they yielded was because these women were unified in their attitude and demanding the pill. When I left, anyway, we would still give anybody the pill. And I think that at one time, we had at least 2,000 women on the pill. In looking back, that was one of the major changes the Aramco Medical Department created in their medical activities.

Hicke: That was quite a significant impact, I would say.

Taylor: I think that's about it. I'm trying to think of any other changes. There probably are some things that I've forgotten about, but those were certainly some of the more major thrusts in our preventive medicine that did make a big impact on the country. I told Brougham one time, I said, "When Aramco is history and long forgotten, the thing they may remember is the medical contribution, because the accomplishments that were made by the Aramco Medical Department did such a lot of good for Saudi Arabs."

Hicke: Well, they won't forget it, because we've got it documented here--right here and now.

Taylor: Okay.

Tapline Stations

Hicke: Let me ask you a couple more things. Did you have anything to do with the Tapline pump stations?

Taylor: Very little. As a matter of fact, Tapline had its own medical department, its own medical director.

Hicke: Even after they were acquired by Aramco?

Taylor: Oh yes. Tapline was always separate. They were like a subdivision of Aramco from the beginning. But they had their headquarters in Beirut. The Tapline offices were in Beirut, and I've forgotten the medical director's name--he's dead now. They used to take care of the office and personnel--of which there were several hundred--in Beirut. They also took care of these little Tapline stations all up and down the desert pipeline--I think it was 1,200 miles of 36-inch pipe carrying oil to the Mediterranean --a long line of these little pump stations. At each pump station, there were two or three people. They had two developments along the line, which were full of Americans. They used air transportation: you either fly a doctor in, or you fly the patient out. They used basically the American University of Beirut Hospital, which was a highly regarded medical center, the best in the Middle East.

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Taylor: It was staffed and run by Americans and was directly connected with the Columbia-Presbyterian Hospital in New York City. Tapline would bring its sick patients to that hospital, where they received excellent medical care.

At first we set a dividing line: if the patients were south of a certain level, they'd come to us. In the end, I think they all went up there because they had such good flights up there and back. And they were small numbers: I think we're talking in the hundreds, the people that were on that line that had to be taken care of.

Recruiting and Hiring Staff

Hicke: Now what about recruiting and hiring people--nurses, doctors, whatever?

Taylor: All the supervisory posts were held by Americans.

Hicke: That was the policy?

Taylor: That was the policy. Right on down to top supervisors. But after you got below that and got into big numbers, we would employ foreign medical personnel. So at one time, we had nurses, for example, from England, Holland, Iraq, the Philippines. Most of our nurses were from India--the largest number. The Indian nurses

were extremely good, because they were trained in a big British nurse training center over in the southeast of India. I've forgotten the name of the area, but that's where they were trained and almost all of them came from that area. The male Indian nurses were the supervisors, and they were very good. Almost all of our wards had a male supervisor except the female ward. The other Western country nurses were always small in number and were under our American supervisors. And they would be supervising smaller segments throughout the medical system.

The doctors: we always had an overriding policy that if a good Saudi Arab doctor applied, he had to be taken and he had to be given a position. So towards the end, we began having more and more of them. But oddly enough, they weren't too eager to work for Aramco. Before Saudi medical schools started pouring them out, there weren't many, and the ones that usually made it went to the University of Beirut. They went to medical school there. In my time, we had something like four Saudi doctors.

For the rest, we had a mix: we had Egyptians, Palestinians--and they were good. Then we had Indian doctors, quite a number of them. And then others, occasionally, like Peter Van Dooren, who was Dutch. For a while there were Dutch medical personnel available. So we had Dutch nurses and Dutch doctors. And they were quite good. But in all circumstances, all medical personnel were under the American system, and the Americans always were the top-level guys throughout the system.

Hicke: Did the pay and benefits improve any as time went by?

Taylor: Well, they kept going up. For example: when I hired the orthopedic surgeon, I hired him for--I remember pretty clearly--I hired him for \$170,000 a year. He was making over \$200,000 at the time, and the only reason he came was for the fun of it. So he didn't stay all that long. Chuck Thomas was his name; he was very good. In fact, he lives right near you somewhere. I know he lives near Portland, Oregon. I kept telling the people in the company: "You should pay doctors much more than you do, so that you get good ones and they stay here." Although oddly enough, the funny thing about it was, doctors would come and they would either like it and stay for a long while, or they would quit quickly--within weeks. Lots of them would make one contract, which was two years, and leave.

But the old die-hards like myself, Phil Gelpi--I think he was nine years; Perrine was much more--I think he was fifteen, sixteen years. There were a lot of doctors who were up in the double-digit range. They just liked the life. They were like me: they had a good time; they enjoyed the atmosphere and the life there.

You had to like that. Phil Gelpi was interested in sickle cell disease--he did a lot of work on that, and there was a lot of sickle cell disease there; we gave him the time and the money to do his research. Perrine, he just liked it. He was a very, very fine doctor, Perrine--a very smart guy. So certain guys liked it, and they would stay. They weren't really interested in getting wealthy. Many of them, like Gelpi, could definitely have had a very fine practice at home; but he just never wanted to be in private practice. Neither did I. I was never in private practice very long. So it was a type that you got who weren't quite as interested in financial advantages. But in the long haul, by the time I stayed that long and built up those benefits and everything, it worked out pretty well.

In fact, I'd be remiss in criticizing it too severely. When I went, I started at \$15,000 a year, but I came out of a system where as a resident, I was making \$2,000 a year. So I thought this was great. It took a long time for that to build up, in sort of standard increments. With each promotion, each time they thought I was going to leave, it would build up much faster.

They did that with other people, too, as well as myself. Aramco did have one intelligent philosophy: if they got an employee that they felt was really good and good for them, they'd go out of their way to do things to keep them. That wasn't just doctors; that was engineers and administrative guys--all kinds of different, talented guys. As a result, the middle and upper management Aramco employees were very good at their jobs.

Hicke: But still, comparably speaking, the pay was not great?

Taylor: Well, you see, doctors' pay, oddly enough, hasn't gone up much in recent years. There's been a cap on it here--I was just reviewing that--so that you can get a good general practitioner for \$120,000 a year, which in doctors' language is the bottom. A cardiac surgeon? He may make \$500,000 a year--a good cardiac [surgeon]. Neurosurgeons make the most: \$700,000 a year. These are averages. So if they were going to hire a neurosurgeon and had to pay \$700,000, they'd say, "Hell, we'll buy a private airplane and fly them all back, because we'll save money." So they probably wouldn't be willing to ante up for such highly specialized and expensive employees.

Now they have very few American doctors left, because of the Saudi takeover, which was a well-disciplined change, by the way. However, one of the major aspects of the change was to replace Americans with Saudis.

Impact of Increasing Saudi Ownership Participation

Hicke: I want to ask you a little bit about that and its impact on the Medical Department.

Taylor: Ever since that happened, they've been weaving in more and more Saudis and Arabs. Although oddly enough, I remember I noticed an ad the other day in the paper that Aramco was looking for medical personnel--doctors, nurses, and so forth. I thought, "Well, I could always go back." So they are still looking. I will say one thing: the Arabs hold American medical practice in very high esteem. They always thought--and I think they still do--that it's the best in the world. They'd go up to London and they'd get super specialist private doctors up there. But they went to London because they got very special attention there. So they always had the policy of bringing in American medical personnel. In my opinion, they are right: the English do first-class medicine, but not as good as in the States.

After I left, one of the Saudis that I had been promoting--Adnan Habbal--became medical director. I think he had a stormy reign as director, because he liked great loyalty, which everybody does, but I think his demands in that area were a little stronger than usual. So anyway, he took over. Then a lot of divisionary problems came up where people would disagree about what we should do next towards making things better--which way to go internally within the medical department.

Another thing about the Arabs, which in a sense is good: they're very fatalistic, and I mean truly fatalistic--not just mouthing it. One thing that always used to amaze me: when they had these big wrecks I was telling you about, their relatives would come in, and the dead bodies would be laid in the back hall. They'd go down the line until they found their relative, wrap them up in a white cloth and take them away. There was never anything like "Well, what happened here?" or "Whose fault was this?" or "What did you guys do for him?" There was never anything like that; it was amazing. We'd lay them over there, and out they'd go. They'd put them over their shoulder, or two of them would carry the body out and put it in a vehicle of some kind. Gone. So there was essentially very few medical legal problems, which is very interesting, because that's one of the big banes of a doctor's existence back here. There's nothing I hate worse than to get a subpoena or have one of my guys get a subpoena. We know we're going in for a long, drawn-out, miserable affair. Well, there was none of that there. That was one of the attractions about being there. They appreciated the medical care they got and assumed those providing the care did the best they could.

On the other hand, it wasn't completely free of oversight by the local system. For example, one time a guy died in our system whose father was the employee. The son had a brain tumor. None of us were neurosurgeons, but that was in the days when Saudis couldn't go anywhere; we had to handle it. So we decided to delineate this tumor and find out how big is it, if it's operable or not. We did a cerebral angiogram, a blood vessel picture of his brain, and after that angiogram, he died. So the fellow, who was named Michael Juraj, who was a crack surgeon, was called down to the local court by the Qadhi and had to explain that. And Aramco said, "Not to worry. We're right behind you."

Well, I attended the Qadhi's questioning session and the Qadhi said, "Juraj, you better have a good explanation for this." The problem was, as I told you before, once you get in their court and are playing by their rules, if you turned up on the short end of a judgment, you might be subject to their very dangerous sentences. That could be very unpleasant, to say the least. Juraj was taking it all sort of matter of factly, until he suddenly realized that if they decided that he did something wrong, it could be a serious problem. The Qadhi ended up saying, "I'm letting this go by, because I think everybody was trying to do their best. But," he said, "in the future, if any doctors like you, Dr. Juraj, are doing things that you're not fully trained to do, there's going to be a bad problem." Well, that cooled things.

So those things we had been doing, which were a little on the margin, you know--like that--we quit doing them. That's all. Nobody was going to do them and run a risk like that. So that's the way the interactions would happen. But that was about the only time that there was a big problem with something like that. That shook up everybody, because Juraj was trying to do the best thing for this boy. He was trying to help him if he could. We all expected that to go through the court in our favor. But it didn't --and we ended up with this warning. So that created an internal resistance on the part of the doctors: "We're not going to do this because of that," you see. They would quit doing things that were a bit out of reach, in a sense. "Should we really do this or not? Suppose it doesn't work out right?" Sometimes that resulted in lack of treatment where there should have been treatment.

Hicke: Tell me a little bit about the impact of the increasing Saudi participation in ownership.

Taylor: Well, luckily, I was not there for the big impact. When I left, it was still under American directorship. John Kelberer was still the president. We didn't feel the impact. And it's my understanding, from talking to people who were still there, that it was a subtle thing. But the major impact was, as I look back

on it, when the Americans were in charge, it was like "Well, we're all in this together, and we're going to make sure everybody does well here in all areas--legal, sickness, whatever the major problems that might arise, were. We will make sure that you get what you are entitled to."

But I think the Saudis are more independently minded; they're more concerned about how they're doing individually, versus the company. As a result, I think everybody feels significantly more nervous about if they go in and say, "Oh, I think my kid's got some serious problem." In the old days, that patient would be hurried back to New York, let's say, to see what it was; I think that that isn't quite as easy as it used to be. And that's understandable, because they don't ship the Saudis out to New York, you see; and you can understand how some Saudi manager who has to approve it would say, "I don't know about this. Why should we do this? We don't do it over here [for the Saudis]; why should we do it for foreigners?" I'm sure that's happened, but to what extent is not clear.

I think that otherwise it's been very subtle. But I think that people don't feel quite as secure about everything. When I was there, we thought, "No matter what happens, Aramco will take care of us." No matter what. Even if it's in India, or something like this. Because the Americans had this intense loyalty. It was interesting: when the Americans were there, they had this idea: "We're all out here together and we're in this strange environment. We're out here on our own, in a sense; and certainly we are going to take care of each other." And that's like when I'd say, "We've got to go there"--we'd go to Beirut or India, pick up employees--nobody would ever say no. Before the Saudis took over, this was policy.

Now I don't think that prevails. With us, it was almost a calling.

Hicke: You had a colony of expatriates, including the management, which they don't really have now with Saudi ownership.

Taylor: Yes, that's right. It's divided off now, and of course those people naturally are as anxious to have their people do as well as the Americans. This is fully understandable. Not that, I think, the Americans asked for anything more, but they just expected more in the way of "I'm over here. I'm working for Aramco overseas." And another thing about the Americans: they also acted like they were working for the U.S. government. They used to say, "Well, if it weren't for us getting out this oil, the United States wouldn't have enough oil. The government would be in a serious problem." We were always very friendly with the military. We'd go down to

the U.S. base, and they'd come up to Aramco. There was a very strong interplay with this big base, which eventually was cut down to a small base, from 2,500 to 500 personnel. I think it's still a small base as far as I know, and probably still uses the Aramco Medical Department.

Hicke: I don't even know if it's still in existence.

Taylor: I think so, because I think they still train the fighter pilots. So anyway, there was not only allegiance to Aramco, but also sort of an allegiance almost like we were a military support team. We were often compared to a big military base because of the compound, security, and all these kinds of things going on. That was a similarity there that kind of came through to people. A lot of these people, as I said initially, were ex-military personnel. Whenever there was a military holiday or anything, we all got into that, because I'd say 75 percent of us, including myself, were veterans or had been in military roles one way or the other. Further in the years we expected them to take care of Aramco in case of riots or attacks on the Americans.

Emergency Preparedness

Taylor: One last thing I'm going to tell you which is sort of a funny thing. You'll get a kick out of it. In Aramco, while I was there, there was always this fear. The Communists were in full bloom in those days. Iran was there. And Iraq was there. And there was always this fear, which the Americans generated, that some of these potential enemies might come down there and try to take over this big oil well. That was, in a sense, a well-founded fear. (Recently borne out by the Kuwait war, the kind of thing we worried about.)

At the same time, the American government made it clear and we thought everybody knew: "Anybody who lays a hand on that oil or attacks the Americans is going to have a war on their hands the next morning." So what we always worried about was before they can get into gear, our place might be blown away. Now this is a fact: we kept a convoy of Kenworth trucks. These were huge, eighteen-wheelers. We kept this convoy set up for evacuation. It was unbelievable. I was on that committee. And they had desert tires on them that were literally six feet across--like this. Those trucks could go anywhere in the desert. They used them on the exploration teams, and they never got bogged down in the sand, essential for forward motion.

I first got into it when I became chief of clinical medicine. Part of my job was the convoy. Those trucks had to be set up medically to take care of all these people that were going to be hauled across the Arabian peninsula from the east coast to the west coast. They were going to go Jiddah. At Jiddah, they had a ship standing by all the time. Everyone was going to get on this ship and go over to Ethiopia. I actually made this trek once, just to see what it was like. They were going to get on this ship over in the Red Sea at Jiddah; they were going to go across the Red Sea; and they were going to Ethiopia--near Addis Ababa in Ethiopia.

They had taken over what had previously been an Italian military facility. It had been evacuated. The Italians were moved out and so Aramco paid for it--whatever they had to do when they got it--and they kept this facility ready. In that facility there was a small hospital. We had to go over there and change the drugs out whenever they get outdated; we had to make sure everything was up to snuff; the I.V.s had to be ready. It was fantastic. The idea of taking care of a large contingent of Aramco men, women, and children there in Ethiopia always fascinated me.

I don't know how long that went on, but many years. An employee named Bill Otto was in charge of it, an ex-navy officer; he took it very seriously. You did not ridicule this plan, neither to Otto or to Aramco. This was a serious back-up plan. We had to inspect these trucks standing by, go through them, take out the old drugs, put in the new drugs, check the food--they had all kinds of long-lasting food in there. They'd take them out every so often and drive them around, make sure that they would still run. They had supply trucks, gas tankers, and everything else--a mechanical truck that could fix them if they broke down. Later these were used to help transport the Saudi Army up to the '67 War.

I said to myself one day, "If anybody ever attacks us, and they see this caravan cruising across the desert, I think they'll be able to find a way to locate it." I told Bill Otto one day--he and I got to be sort of friends--I said, "Bill, I don't understand you. Sometimes I think you really believe this stuff." Oh, he went through the ceiling. He said, "I'll remember that. I'll remember that. By God, when that caravan leaves, you're not going to be on it!" [laughter]

Hicke: You lost your place!

Taylor: Can you believe for years we kept that thing in there for evacuation? And even to this day I think, "Could that have

possibly have been?" A lot of these people would've gotten sick. We had all kinds of stuff in the caravan--I.V.s and everything else, but that trek across that desert would take two or three days, at best. And if you did that in the middle of summer--wow! --you'd endanger more people going across 1,000 miles of sand than they'd ever kill with bombs. But we did that faithfully, all the time. He'd call a red alert like the damn movie. Red alert. We had a red alert meeting. I'd say, Oh, one of those! I couldn't help but laugh occasionally. "Taylor, how many patients can you get in that Kenworth?" Because we had to evacuate the hospital.

I said, "Fellas, is this for real?" Those guys used to sit there and monitor the northern airwaves. Every once in a while, somebody would fly through that zone. I remember one time some Russian military planes flew through the northern part of Iraq, down over Iraq. Iraq didn't even know it; but we knew it. We got all excited, alerted the U.S. Air Force, and for a few hours we really were on red alert.

Hicke: Bill was going to start up the trucks?

A Riot in Dhahran

Taylor: I tell you, that was some deal. And then, of course, once we had a riot. The hospital sat right on the road, and we were looking out the window, and these guys were getting carried away. So I call up Brougham at the time. And I said, "Bob, these guys really look pretty serious about it." "Oh, no. We've gotten clearance. Ibn Jaluwi said not to worry; they're just going to agitate out there, do a little chanting and beating the drums, and we're not supposed to get into it. Just don't worry about it." I said, "But I'm looking out the window, and I don't think these rioters have gotten the word." I was looking, right? I said, "Are you looking out the window?" He had a window that faced out. "Do you see these guys down here tearing this fence down? When they tear this fence down, do you think they're going to stay on their side of the fence?" He said, "You know, Taylor, you've got a point." So I said, "A point? Man, these guys are going to be in here." And sure enough, within minutes, they came storming through.

The first place they hit was the hospital. I told Flynn, who was my chief administrator, "You go down and lock all the doors so they can't come through here." He said, "Okay." So he ran around, got a couple of other guys, and they locked all the doors. I went down. They came marching through; they tore up the place but didn't hurt anybody. They tore up the whole compound. It was

a wild day. And they were wild, partially out of control. So they were running around and all the Americans were suddenly scared to death. All of us were moving to the back of the compound, and actually getting fortified.

So, anyway, I go downstairs and all of a sudden all these guys, these rioters are running right through the hall. They were coming in this side and going out that end. I'm standing there, "How in the hell are these guys getting in?" I thought we had all the doors locked. It turned out we locked the doors from the inside--but not the outside. They could get in but then they couldn't get out. This didn't seem like a good way to go, so we opened up the doors and the rioters ran up into the compound.

Hicke: Oh no!

Taylor: The only trouble they were having was getting out at the other end. "Open the back door, so they can get out!" [laughter] I never let Flynn forget that. I said, "You locked us in and you let them in. Great move." That was a very frightening situation for a few hours.

It was interesting because anybody who wanted to leave, could leave. And a lot of doctors and their families wanted to leave.

Hicke: During the riot?

Taylor: Yes, because of this riot. But then old Ibn Jaluwi--I told you he was a very tough old soldier--sent over his personal white army. The regular army dressed in khakis and they looked like soldiers; but his men are dressed in long, white, flowing robes. They used to wear these white turbans and white outfits and a black belt. They carry big swords and, of course, guns, and don't hesitate to use them.

Brougham, meanwhile, is calling up Ibn Jaluwi and saying, "Your Highness, Ibn Jaluwi, it doesn't look as calm as we thought. These guys are coming through the fence." Ibn Jaluwi said, "What? They're not supposed to do that. You tell them I said to get back, leave the compound!" Brougham said, "It's hard for me to get through to them. They're not listening." He's telling me this story later, and it was humorous later, but not at the moment.

So Ibn Jaluwi said, "Well! We'll take care of that." He sends his personal army. It took them about an hour to get there, that seemed much longer. But when they showed up, the rioters were suddenly the endangered species. Oh, these guys were swinging these swords and they got a few of the rioters, major

cutting injuries. In fact, we ended up taking care of them in the hospital. They killed two rioters, one of whom was the leader.

V OVERVIEW

Hicke: Could you give us an overview of Aramco's impact?

Taylor: Just in summary, I think that the overall impact of the medical was extremely beneficial, and set a basic standard of care that they built on. I think it did then and has continued to provide good medical care. I think it was one of the best things that Aramco did, as far as doing something good for the country, being a good citizen or whatever you want to think of as a good company --which Aramco definitely wanted to do. They wanted to present themselves as a good citizen and somebody who was interested in the country and its development. So we were a part of that and I think we did our share.

I think we did more than our share, and I think it worked out to their benefit, helping them get going as we did in several different areas. Our major influence was in the Eastern Province. All in all, I think the whole thing was good. I will say this: I truly don't think that there was any particular emphasis on doing good for the Americans and not doing just as much for the Saudis. And I'll tell you something: there were a lot of nice Saudi people who truly appreciated the Medical Department. They were so grateful, this was half of their world. When you did something, particularly when they weren't entitled, God, they were so thankful they'd make you cry, because they had nothing else to do and no place else to go. That part was always very gratifying to the people who were working in the medical department.

And of course we had a lot of Arab doctors; they were more intent on taking care of those people. So there was not a real double standard, except for the evacuation part, which was something that was policy. I don't think there was any way to get out of that; in my opinion, the Saudi government should have approved medical evacuation of Saudis. I think the basic idea was: "If you get sick out here, we will return you, unless it's impossible, to your original site, and you can get the medical care that you'd get there." So that's what we did. I think it

was pretty reasonable for everybody. From the professional viewpoint, I think we did a top-notch job, and I think we delivered wonderful service to all those who used the service of the Aramco Medical Department.

I think Aramco should have spent a little more money and been more into keeping up with American medical standards, but they'd tell me: "We spend too much money on you guys!" So it probably worked out to a draw. I think they probably did it about right, at least in their mind; they weren't oblivious to that fact that it was a good PR move. That's about what happened; that's what it was like.

[Following material was added later] One thing I'd like to add to this discussion is the separation of the clinical from the preventive health/public medicine contribution. On the clinical side, we accomplished the most by introducing therapy not previously available. The major areas were proper treatment of malaria, TB, and intestinal parasites. We certainly cured many of these patients, returning them to normal life. At the same time we introduced mosquito control, prevention of spreading TB, and artificial fertilizer. These public health measures had an impact on large numbers of Saudis and were adopted by other countries in the Middle East, and certainly today continue to prevent large-scale illness.

On the practical level, sewers, in-house water and toilets, and public health hygiene training represented another huge step in the progress of fighting disease in Saudi Arabia.

Another measure that resulted in much better health was our massive immunization program for employees and dependents. This prevented many illnesses that had been a way of life before.

Finally, our insistence on the "American way" in ethics--equal medical care for all we cared for, appropriate training of medical personnel with no exceptions no matter what nationality, including Saudis, proper record-keeping--all resulted in a level of care that had never prevailed before. I hope this type of ethical thinking continues on, as it is the mark of true medical progress, not only in the Middle East and Saudi Arabia but throughout the world. [End insert]

Hicke: That's great. I just had one more question. Do you know of other corporate offshore medical operation--

Taylor: Oh yes.

Hicke: --to compare to this?

Taylor: Oh, to compare to that? No. But there are several, like Esso has a big one down in Barranquilla, where they have a big oil situation. I was in that once. I was in there because we had a patient that I took in there when I was in the merchant marine. We had a sick man and we took him in there, and it was the oil company hospital. I had the feeling that they used the hospital, and therefore they kept it up to good standards, but I didn't have the feeling that they really owned it. I think they just had a lot of influence on the level of care that was rendered there.

Now the British had a hospital in Kuwait, and they had a hospital in Bahrain, but it was a matter of not just oil but of colonialism. It was there not entirely for oil. And so to my knowledge, there was never anything like this. Indonesia: I know they had a hospital there, but I was never there, so I never knew how it worked. It made a big difference where we were in total control, and we demanded JCHA quality versus being in a hospital where the government or other outfit was in control and didn't demand that level of care. So I think--and I'm pretty sure I'm right--that probably the best quality medicine outside of the United States for expatriates was there in Saudi Arabia. I don't want people to think that, as some people used to think, "Well, my God, you had the Mayo Clinic." We didn't have the Mayo Clinic out there. But at the level we were working for, we did good work--very commendable, as far as I'm concerned. I think it was about right for the situation: because if you went there, you had to have a spirit of adventure; you couldn't expect the Mayo Clinic out there, I'll tell you that. So that's the way it worked.

Hicke: You summed it up very well a while back when you said that if you had it to do all over again, you would.

Taylor: I would. When you talk to these other medical physicians, ask them. I'd like to know. Now, Gelpi, he was there nine years and I know he enjoyed it, but I think he would say, "No, I stayed long enough." Perrine would've stayed even longer, but he finally wore down under the pressure and left. And Dick Handschin--whom you're going to see--left under duress; he wouldn't have left except for this personal problem he had with one of his children. So there were mixed reactions. Bill Weidman, who stayed until he retired, loved it out there. He followed me; he was the chief of clinical medicine. It depended very much on your personality. You had to have a certain rugged, individualistic character to enjoy that there, because many times it was not physically pleasant. But all in all, it was a great adventure.

Hicke: I'd like to thank you very much for spending this time recording your recollections of your career with Aramco.

Regional Oral History Office
The Bancroft Library

University of California
Berkeley, California

Aramco Medical Department Oral History Project

John C. Snyder

TRACHOMA PROJECT

A Written Account

INTRODUCTION by A. P. Gelpi

This is the story of the trachoma project in Saudi Arabia--jointly sponsored and supported by the Arabian American Oil Co. (Aramco) and the Harvard School of Public Health--as seen through the eyes of one of its prime movers, Dr. John C. Snyder. As chairman of the department of microbiology at Harvard's School of Public Health, Dr. Snyder helped launch the project and set its goals. Becoming the dean of the faculty at the HSPH, he remained a guiding light for much of the project's twenty-year life span.

A. P. Gelpi

September, 1996
Sonoma, California

EDITOR'S NOTE

Dr. Snyder declined to be interviewed for this oral history project, but kindly submitted the following written history of Aramco's and Harvard's trachoma project.

Carole Hicke

The Harvard/Aramco Trachoma Project

[The following is quoted from Dr. Snyder's papers, and Dr. Snyder retains copyright.]

In the fall of 1953 Dean Simmons of the Harvard School of Public Health (HSPH) was invited to speak at the annual meeting of the Persian Gulf Medical Society. That year Aramco was the host for the sessions, in Dhahran, Saudi Arabia, where the new hospital and laboratory facilities were nearing completion. Dean Simmons was invited to give three separate speeches touching on matters of concern to the members of the organization. The meetings were scheduled to begin in the last week of November. The Simmonses were to be transported in Aramco aircraft, with stops in the Azores, Holland, Rome, and Beirut en route.

Very shortly before the date of departure, Dean Simmons developed an illness that prevented his travel at that time, particularly because he had already entered into firm commitment to undertake an extensive tour of Asian countries early in 1954 to search for institutions where "Bridges of Health" could be developed between the school (HSPH) and interested organizations, whether academic or industrial. [Under Dean Simmons's aegis an organization entitled "The Industrial Council for Tropical Health" had been formed in 1950, with its first meeting in Boston, as guests of the HSPH. Simmons's role in that organization and his plans for the future undoubtedly led to his invitation to address the Persian Gulf Medical Society.]

On the late afternoon of Wednesday, the day before Thanksgiving, 1953, I was about to take my wife and our three small children to New Hampshire for a short holiday. The telephone rang about 5:30 p.m. to tell me that Mrs. Snyder and I were invited by Aramco to substitute for the Simmonses if we could leave the following Tuesday for Dhahran to give the three talks on the subjects already assigned to Dean Simmons. A prompt response was essential. Our weekend in New Hampshire was cancelled--against the wishes of the children, to be sure!

It was necessary for me to arrange coverage of my academic duties during my absence, and for Ginty [spouse] to obtain permission from Milton Academy to find substitutes who would take charge of her activities as teacher of seventh grade classes in geography and mathematics. Milton Academy saw the importance of a visit to the Middle East for their geography teacher, and by the end of thirty-six hours we had persuaded a very reliable person to live in our house to look after our children.

Passports, visas, immunization, documents required by Saudi Arabia, indoctrination in Aramco's procedures, etc., were attended to in the New York office of Aramco by the medical staff. Seven days after the invitation was received we were at the New York airport embarking for the journey in Aramco's propeller plane, a DC6, on its scheduled trip to Dhahran. I had the titles of the three speeches, but no notes from Dean Simmons's secretary as to his plans for the material to be covered. My small portable typewriter was busy during several of the long stretches of smooth air en route. Ginty studied all the documents about Saudi Arabia and Aramco that were provided by the New York office. An overnight stop in Holland kept us from excessive fatigue. Arrival at the Dhahran airport occurred late in the afternoon on the day before the opening session of the Persian Gulf meetings.

In addition to the formal papers, the sessions included brisk discussions by the members of the Society--all of whom were either physicians or surgeons or professionals in fields allied to medicine and public health. A few guests were included in the audiences, mostly those involved in administrative affairs of the several different industries operating in the Middle East. We were all shown the new Dhahran Health Center, especially its medical and laboratory facilities that were nearing completion.

During the tour of the center I became especially interested in the empty space described as the "future laboratories for activities of the Medical Department." Answers by the tour guides were vague when I asked what was expected to be studied in that space. The vagueness was dispelled later when I had a chance to talk alone with the chairman of the Aramco board, Fred Davies, who had attended some of the medical meetings. He asked for suggestions: what would be the optimum use of their new laboratory space? That was an easy question. Having spent nearly two years in Egypt, with visits to Iran, Turkey, and several North African cities, I replied that some of the local health problems should have high priority. One of the speakers at the meetings had described trachoma as a serious problem in the Middle East, causing poor vision especially among local inhabitants serving as employees. I told Mr. Davies that research on trachoma might be a possible joint undertaking by Aramco and Harvard. I promised to send specific details after I had returned to Boston for a conference with Dean Simmons and my colleagues in the microbiology department.

Our research at the HSPH had revealed important properties of microorganisms that could only multiply inside living cells. [Therefore,] we felt confident that some of the procedures and techniques we had developed for typhus and other rickettsial diseases could readily be adapted to studies of trachoma infections in Saudi Arab employees of Aramco. Furthermore, the procedures would be valuable in several of the Middle Eastern countries elsewhere as well.

At that time the organisms causing trachoma had not been grown in laboratory studies nor were they accurately identified. Candidate microbes, however, could be observed inside the conjunctival cells [cells covering the eyeball and inside the eyelids] of patients. After several conferences, I prepared a proposal for Dr. Robert Clinton Page, the medical director of Aramco, and Dr. Richard H. Daggy, the assistant medical director, outlining a joint research program financed by Aramco with activities in Dhahran and our laboratories at the HSPH. Meetings with them and with officials of the four parents organizations of Aramco were undertaken in New York, followed by long sessions with Aramco's lawyer, John Noble, and with the staff of Harvard's Office for Research Contracts. It became clear that there would be no possibility of an outright grant from Aramco (or from the Saudi government) for research, but that a detailed contract might suffice.

This was one of the earliest of contracts between Harvard and an industrial organization. There were no guidelines for the process. Despite several issues that threatened to sidetrack the proposals, John Noble and I managed to devise safeguards to assure uncensored publication of research results and to indicate Harvard's respect for Saudi Arabia's identity as well as its role as the major donor of the funds.

Obtaining approval of the contract document was less arduous than Noble had anticipated, in large part because several of the medical officials of the four parent companies of Aramco had participated in the 1950 and 1954 meetings of the Industrial Council for Tropical Health at HSPH. Trachoma as a major cause of impaired vision in the Middle East had been stressed by industrial delegates to those meetings, and reinforced by the presentation of Dr. Phillips Thygeson, the American ophthalmologist who was recognized as one of the ablest of the experts in clinical diagnosis of trachoma.¹ From early January until mid-May of 1954, my assignment was "Acting Dean of Faculty" [while Dean Simmons visited several countries in Asia searching for cooperative arrangements for the "Bridges of Health" he had proposed for the HSPH], and therefore I was able to facilitate progress toward completion of the Harvard-Aramco contract.

Dean Simmons died in July, 1954. The president and governing boards of Harvard appointed me to succeed him as dean of the faculty, effective October 15. My new responsibilities for the HSPH reduced the amount of time and effort I could devote to the studies in Arabia, but over the succeeding years I made eleven trips to Dhahran--the longest being six weeks in the summer of 1958.

¹ Industry and Tropical Health, New York, 1951, Robert Kelly Publishing Co.; Industry and Tropical Health II, Cambridge, 1955, Harvard School of Public Health, Libr. Congress #52-34882.

Both parties signed the contract, to begin on October 1st, 1954, and to extend for five years. During the first few months, selection of equipment of the Dhahran laboratories and personnel to undertake the field studies occupied the team in charge of the project.

John C. Snyder, March 30, 1996

Regional Oral History Office
The Bancroft Library

University of California
Berkeley, California

Aramco Medical Department Oral History Project

Elinor P. Nichols

ROGER NICHOLS AND THE TRACHOMA PROJECT: 1956-1982

An Interview Conducted by
Carole Hicke
in 1996

Since 1954 the Regional Oral History Office has been interviewing leading participants in or well-placed witnesses to major events in the development of Northern California, the West, and the Nation. Oral history is a method of collecting historical information through tape-recorded interviews between a narrator with firsthand knowledge of historically significant events and a well-informed interviewer, with the goal of preserving substantive additions to the historical record. The tape recording is transcribed, lightly edited for continuity and clarity, and reviewed by the interviewee. The corrected manuscript is indexed, bound with photographs and illustrative materials, and placed in The Bancroft Library at the University of California, Berkeley, and in other research collections for scholarly use. Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, partisan, deeply involved, and irreplaceable.

All uses of this manuscript are covered by a legal agreement between The Regents of the University of California and Elinor Nichols dated April 19, 1996. The manuscript is thereby made available for research purposes. All literary rights in the manuscript, including the right to publish, are reserved to The Bancroft Library of the University of California, Berkeley. No part of the manuscript may be quoted for publication without the written permission of the Director of The Bancroft Library of the University of California, Berkeley.

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It is recommended that this oral history be cited as follows:

Interview with Elinor Nichols, an oral history conducted in 1996 by Carole Hicke in "Health and Disease in Saudi Arabia: The Aramco Experience, 1940s-1990s," Regional Oral History Office, The Bancroft Library, University of California, Berkeley, 1998.

Copy no. _____



Dr. Roger Nichols and Elinor P. Nichols, Museum of Science,
1986.

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INTRODUCTION--Elinor Nichols

Dr. Roger Nichols joined Aramco's medical staff in Saudi Arabia in 1956 following two years of residency training in internal medicine, and in 1957 he was appointed by Harvard's School of Public Health (HSPH) to be field director of a research project on trachoma, which was jointly sponsored and supported by Harvard and Aramco. He held this position until 1970, at which time he took over as director of the project and head of the Department of Microbiology at HSPH. The trachoma project ended in 1975, and Nichols turned to full-time teaching and research at Harvard, where he remained until 1977. At this time he was selected to be the director of Boston's Museum of Science, a position he held until his untimely death in 1987. The trachoma project--and Dr. Nichols' contribution to this effort--is one of Aramco's notable contributions to its host country, Saudi Arabia, and to international health.

Elinor Nichols was not only wife, mother of their three children, and companion, but contributed personally to the trachoma project in field studies. It is largely from her recollections that it was possible to build a history of Roger Nichols. For this is also Elinor's story. It is inextricably part of a larger mosaic of love, marriage, life of a medical student, a young doctor and his wife trying to make ends meet, academia, association with Aramco, life in Saudi Arabia, the trachoma project, personalities from the Harvard School of Public Health, and the resumption of new careers in New England at the twilight of the twenty-year Harvard/Aramco trachoma project. Elinor has given the reader a firsthand glimpse into the exciting role of an expatriate exploring the mysteries of the Middle East and participating in a joint venture in which industry and the university become partners in researching an eye disease which was, and may still be, the world's leading cause of blindness.

Dr. Nichols and I were colleagues and friends. I remember him best as one of the most dedicated researchers I have ever known, a man whose enthusiasm for the trachoma project, Saudi Arabia, its people, and the field of microbiology was as contagious as trachoma itself.

Armand P. Gelpi, M.D.

December 9, 1997
Sonoma, California

Nichols' Death a Blow to Science Museum Community



Roger Loyd Nichols

Roger Loyd Nichols, M.D., president and third director of the Museum of Science, Boston, died suddenly on December 10 of an apparent heart attack. He was 61.

"Roger Nichols' untimely death is a tragedy," said Bradford Washburn, who directed the museum from 1939 to 1981. "He was a brilliant star in the public education arena."

Dr. Nichols joined the science museum community in 1982, when he left the Harvard School of Public Health

where he had served as department chairman for seven years, to direct the Museum of Science, Boston.

Although Dr. Nichols was a member of the science museum community for less than six years, his leadership and accomplishments quickly gained international recognition, and he proved to be an eloquent spokesman for the importance of science literacy and informal science education, serving as an advocate on Capitol Hill and elsewhere. As chairman of the ASTC Legislative Committee for four years, Roger urged ASTC to publish a science museum advocacy manual (published in 1986) that would help guide science museums in their efforts to have an influence on legislation.

Senator Edward Kennedy said, "Roger Nichols was warm, sincere and humorous. He was dedicated to improving science education in our country and succeeded at this task. He will be greatly missed as the task continues, but greatly remembered for moving us up the mountain."

Under Dr. Nichols' dynamic leadership, American museums formed several collaboratives, pooling talents and resources in such areas as exhibits design and preparation, film networking, and educational programming. Although the idea of forming collaboratives had been around for a number of years, "Roger

made science museum collaboratives respectable, indeed, popular," said Joel Bloom, president of the Franklin Institute Science Museum.

Dr. Nichols was responsible for the opening of a new wing at the museum that greatly expanded exhibits and educational programming and which houses a \$14-million Omnimax theater.

Most members of the science museum community are familiar with these accomplishments, but may not be aware of his achievements in the medical field.

A 1953 graduate of the University of Iowa Medical School, Dr. Nichols was a research specialist and author in the field of microbiology. He spent more than 20 years of his career in field research in Third World countries, including Kenya, Uganda, Ethiopia, Haiti, Saudi Arabia, and Iran. He also helped plan and implement a new medical school in the Eastern Province of Saudi Arabia, and helped to start up a large general hospital in Doha Qatar in the Arabian Gulf.

He is survived by his wife Elinor (Potee) and three children: Quafe, a member of the Peace Corps in Swaziland; Kathleen, an attorney who lives in Izmir, Turkey; and Wendy, an instructor at Polytechnic Institute in Isatown, State of Bahrain, Arabian Gulf. He is also survived by a brother, Frank, in Davenport, Iowa. ■



Roger Loyd Nichols

April 29, 1926 - December 10, 1987

*"O Lord God, when Thou givest
to Thy servants to endeavor any
great matter, grant us also to
know that it is not the beginning
but the continuing of the same
unto the end, until it be thoroughly
finished, which yieldest the true glory."*

Sir Francis Drake

*"People just don't dream
big enough."*

*"Don't get into the thick of
thin things."*

*"In most of life, what matters
is not how smart you are but
how much glue there is
between the seat of your
pants and the
seat of your chair."*

*"You gave the best you had,
and that is all that I will
ever ask of you.
Good job.
Well done."*

INTERVIEW HISTORY--Elinor Nichols

Elinor Nichols for nearly twenty-five years participating fully in the life and activities of her late husband, Dr. Roger Nichols. She was interviewed to record her knowledge of her husband's work, as well as for her own informed views on the people and country.

Dr. Nichols joined Aramco in 1956, shortly taking over responsibility for the Trachoma Research Program. Trachoma was then the leading cause of blindness in the world, and Aramco management had decided that research on the disease would be a way of helping the Arab people that would benefit them greatly. Although he did serve as director of the Medical Research Division 1963-1970, and was thus involved in other administrative duties, Dr. Nichols's work is most warmly remembered as head of the trachoma investigation. The Nichols left Saudi Arabia in 1970, and Dr. Nichols continued to work on the project as director and principal investigator at Harvard. He was director of Boston's Museum of Science when he died in 1987.

Elinor Nichols describes something of her husband's background, providing an interpretation of his character and successful career. Her portrayal of their travels into the desert and to other countries tells much about the life of the expatriates in Saudi Arabia.

Elinor Nichols was interviewed on April 19, 1996, at the Harvard Club in Boston, Massachusetts. She brought along some copies of her husband's correspondence, which will be deposited with the oral history. She also donated to the library a book edited by Dr. Nichols, *Trachoma and Related Disorders*, 1970, which publishes the Proceedings of a symposium held 17-20 August 1970. She talked enthusiastically and warmly about her husband's work and their life together. Reviewing the draft transcript, which had been lightly edited by me, she made few changes.

Carole Hicke
Project Director

January 1997
Regional Oral History Office
University of California, Berkeley

Regional Oral History Office
Room 486 The Bancroft Library

University of California
Berkeley, California 94720

BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

Your full name Elinor Patee Nichols

Date of birth March 11, 1927 Birthplace Nagpur, India

Father's full name Kenneth Lyon Patee

Occupation Protestant Missionary Birthplace London, Ohio
2 minister

Mother's full name Esther Gale

Occupation Missionary (to India) Birthplace Mexico, MO
= 45 years

Your spouse Roger Loyd Nichols

Occupation Medical doctor Birthplace Waverly, Iowa

Your children Kathleen P. Nichols (1/24/53)

Judy P. Nichols (1/4/54), Quarfe Frank Nichols (8/20/61)

Where did you grow up? Central India - birth - age 17

Present community N. Scituate, MA (28 miles S of Boston, on
Bailey Island, ocean)

Education B.A. - 1948 - Oberlin College
M.A. in Social Work (medical) - University of Iowa, 1951

Occupation(s) Social Worker - 2 years

mother, then 10 years as Recruitment Manager for
med. school & Teaching hosp. in Saudi Arabia

Areas of expertise People, children,

Hard work & friends

Other interests or activities Reading, Travel, Archaeology,

Writing, People, ballroom dancing, soccer, Tennis, cross country
skiing

Organizations in which you are active Museum of Science - Volunteer -

Boston's Women's Travel Club - President 1995-1997

I JOINING ARAMCO

Roger Nichols's Education and Internship

[Date of Interview: April 19, 1996] ##¹

Hicke: Let me ask you how you and Dr. Nichols got to Saudi Arabia.

Nichols: That's a good place to start--at the beginning. Roger went to medical school at the University of Iowa, choosing that because Case Western Reserve in Cleveland, which accepted him, was considerably more expensive. He had grown up in Iowa, so he was an Iowa resident, and of course, residents do receive much less expensive educations; so rather reluctantly he chose to go to the University of Iowa. And we got married the summer before that, which was 1949. I went to graduate school in psychiatric social work for the first two years of that, and he had, of course, the four years of medicine. He finished that and graduated in '53; by that time, in June of '53, we had our first child, Kathleen, born in January of '53. Unfortunately, she was born the night before his national board exams; so he was up all night studying, and I didn't really have a great deal of time to encourage him through this new baby arrival process. He came in once; he patted me on the head and said, "Breathe fast and I've got to go study." I'll never forget that.

But he was looking for a residency, an internship, and the Chief of Medicine at the University of Iowa--he had graduated from the Harvard Medical School, here--wrote to Harvard and said, "This is the brightest, most energetic young man I've ever met in my life," and said, "Please consider him for an internship, a

¹This symbol (##) indicates that a tape or a segment of a tape has begun or ended. A guide to the tapes follows the transcripts.

residency." So that brought us to the Harvard area in the summer of 1953. At that time, Boston City Hospital was owned and run by three teaching hospitals: Harvard, Tufts, and Boston University. Roger was brought into a rotating internship under the Harvard service at Boston City Hospital, which was excellent medicine, because nothing was as good as the City Hospital; he received the widest breadth, as you know, of good clinical cases. So we were here from '53 until '56.

Looking for an Overseas Position: 1956

Nichols: He was two years into his three-year residency in internal medicine: the first year is rotating internship. Well, we had borrowed, I think, the staggering sum of about \$3,000 from his parents, who were retired farmers from Iowa living in Florida. We'd never borrowed before, and it really bothered us. His internship and residency salary in the early fifties was \$3,000 a year. So we were living pretty much hand-to-mouth; and now by that time, we had two children, two little girls.

Hicke: What's your second daughter's name?

Nichols: Wendy. She was born in November of '54. So we sat around and said, "Well, we've got to pay Dad Nichols back somehow, so let's take out a year or two and go overseas to some interesting spot," where, as a clinician, he could earn enough money in one or two years to pay his parents back. My parents, who were missionaries in India, were back in the country--that was the summer of 1956--and we were taking care of some friends' house. That's another story. So we were living free, in return for taking care of this huge house, which was great fun. Kooky people, but I loved their house.

We looked up places all over the world; and my father typed thirty-seven letters, which went out to companies all over the world, looking for a medical position. Only two of them responded with something that was feasible. Everybody else wrote back--Venezuela, Tripoli, you name it--they all wrote back and said, "We only hire local physicians. We have no positions for American physicians."

But the Gold Coast in Africa: the Lever Brothers soap people had a tent city on the Gold Coast, and they were offering fairly good salaries for American doctors. The only other company that responded positively was Aramco, the Arabian-American Oil Company, with headquarters in New York. They were offering

American physicians jobs, and I think the salary was \$25,000 or something--it was a fairly good salary compared to \$3,000. And those contracts were always for two years; so we thought, Perfect. That's why we moved out of his residency program, thinking, for two years. We'd pay off Dad; come back; and then go back into the Harvard service to finish the residency. We sent in all the material they wanted and he went down to New York. You asked [in the outline] with whom he interviewed. He interviewed with Robert Page, Dr. Robert Page. I noticed in Jack Snyder's letter or summary that actually Page, in '54--you'll see this here, '54, now, this is '56--but in '54, he was medical director. So I don't know at what point he came back to New York to take over the top position of hiring physicians. Roger went down there, and was interviewed by Bob Page.

Hicke: He was a very early doctor in Aramco.

Nichols: Yes, he was, and you may know more about his background than I do.

Hicke: Anything you can tell me about him--

Nichols: I can't. I don't know anything about him, but I think you'll find that Dick Daggy does, because at that time, in '54, Dick Daggy was associate medical director in Aramco. Page and Daggy worked together, which I did not know until Jack Snyder's summary came out.

Moving to Saudi Arabia

Nichols: So they hired him. The first letter I've xeroxed for you is December 8, 1956. Roger left at the end of the summer, maybe in November of '56. Now, housing was tight in Saudi Arabia; so we were told from the very beginning that no family could come for the first year. I think it was partly because it was too expensive to fly families over, and then have a guy look around and say, "This is horrible. I'm not going to stay here." And a lot of the doctors did. They'd go over there; they'd look around and they just hated it, and they simply got back on the next plane. One guy actually stepped off the plane into the desert, looked around, and said, "This is it," and he got right back on the plane and came back. So you can see why they had to protect their own finances a bit.

That left the two little girls and me in this big house in Belmont [Massachusetts] for a year. And Roger went over--nothing

to do with trachoma--he went over there as a general physician. He was in Abqaiq, as I remember, five months--and I think you'll find the actual dates in here. He was just a clinician, taking care of patients.



Trachoma Team, Dhahran, 1965? Left to right: Dr. Sam Bell, Dr. Nadime Haddad, Dean John C. Snyder, Dr. Roger L. Nichols, unidentified, and Dorothy McComb.

II THE TRACHOMA PROJECT

Roger Nichols Gets Involved

Nichols: I think five months after he was there, Sam Bell, who was sent out by Jack Snyder, who at this point was dean of the School of Public Health, but also the head of the Department of Microbiology at Harvard--so this was probably early '57--they sent Sam Bell out, because they had had to fire an Italian who was in charge of the trachoma program. So you have to read in here [Snyder's paper] when the trachoma program was started, why it was started and how it was started--which Snyder is giving you, which you just have to have. Very interesting.

So they fired--Dottie should have told you the name, or maybe not--

Hicke: She did. It was Mario Tarizzo.

Nichols: They sent Sam Bell out, Harvard finding its own. And Sam evidently came to Roger and said, "We need somebody to take over." They weren't offering a directorship, but sort of a part-time position to run the research program. So he was going back and forth between Abqaiq and Dhahran. And these letters, which I have not read in entirety, will tell you when he actually moved over to become head of the department of the trachoma research lab. Now, my memory is, Carole, and this could be entirely wrong--and I hope Dottie could help you or Dick could help you--but Aramco, at Jack's suggestion that trachoma was the number one health problem in Saudi Arabia, when they were looking for something to do with lab space they had just built, and how can we help the Arabs the most--it was Jack Snyder who said, "Trachoma is the leading cause of blindness in the world." In Arabia, at that time, about 98 percent of the people had had it. So this was a health hazard of enormous concern. I thought that I remembered Aramco gave Harvard \$5 million over a twenty-year

period to do research, and that must have started in '54 or '55. But you'll have to find out more from Snyder. I'm sure it was \$5 million.

Hicke: I haven't heard what Aramco's contribution was.

Nichols: I'm sure somebody in Aramco has a record of this.

Hicke: Right.

Nichols: So it was a twenty-year project, and we got into--he, Roger, got into it--I say we because we were very much involved in all of this.

Nichols Heads the Project

Hicke: And Aramco also gave his time? The company underwrote his work?

Nichols: Well, they finally put him in charge of the whole research project--we had the best of worlds: we were with Harvard, which Roger loved, doing research; and being paid oil company salaries; and living in Aramco, which is a country club: you know, twelve tennis courts, swimming pools, good schools. So we felt very fortunate, because I don't think he would have stayed out there as a physician. It would have been very difficult to stay out there, because there were some problems and difficult people to work with, and the desert; and he was lonely and so forth.

Once he changed over to Harvard, it suddenly became a much more exciting intellectual exercise for Roger Nichols, who, incidentally, I have to tell you was a brilliant man. He had an enormous amount of integrity, and an enormous amount of optimism and energy; and a combination of these four qualities is really something to see. He was a farm boy who grew up in Iowa. His parents were high school graduates, and that's all--and nice people, good hearted, didn't speak good grammatical English.

He was driven by what he used to say was a real burr underneath his saddle; he was so bored with growing up--he was so smart and so bored. And he always complained to our children that they didn't have a burr under their saddles, because life was much easier for them. Whereas they were Iowa farmers who were poor, and they were hungry, and they worked hard from dawn to dark.



Dr. Roger L. Nichols examining child's eyes for Trachoma, Saudi Arabia, approximately 1963.

And his mother had a driving force behind her, which always puzzled me, because she seemed such a simple woman; but she'd back the two horses and the tractor up to the back of the farmhouse when Dad Nichols was taking a nap after lunch, go in and wake him up and say, "There's no time to sleep. Get back out." She was the same with Roger, you see.

Hicke: That's interesting. You could grow up so bored that you would just turn off of everything.

Nichols: Right! She probably made that difference, though. It was very tough for him, because when he was in fourth, fifth, and sixth grades, she wanted him to compete with all those grade students in the entire state of Iowa. She would get him up at four in the morning to practice his spelling for the bee, his arithmetic. And I always kind of resented that, in a way, because it gave him ulcers, migraine headaches; his stomach was twisted. But she did drive him; and because of that, really in the long term, he was a truly driven man himself. He really wanted to get a lot done and make a difference in the world. And he really did. But he was driven.

And with that goes some very painful things that are very hard to deal with, both for him and those who are around him. He always said to me, "I know I'm hard to live with." And I always lied and said, "No, you're not." [laughter] But I mean, I knew enough having my own psychiatric social work and medical social work background and so forth. I knew his parents well, and I lived with him. So I knew from whence this came. And I think, even fairly young, I understood that it had its dark side, but that it made Roger--in a way--the great person that he was. He was an A type; and the A types always die young, as you probably know, because they drive themselves too much and so forth.

Hicke: There is that too.

Nichols: Yes. Okay, where are we?

Hicke: Well, we're only six months into his work in Saudi Arabia!

Nichols: Okay, so he's out there and sort of asks my permission--. We were quite a team. We always felt I had--and I think he was right--a better sense of people, and I feel--most women do--I feel closer to people. And he always sort of trusted me to read the people around him and to pass on any knowledge because, like most men, he was progress and program oriented. He was good with people, and people who worked with him followed him and adored him, but he never read a novel. He didn't have time for fiction. We were a real team, I think, because we could give

balance to each other; he was much brighter than I was, but I had enough intelligence and education to go along with him.

So that year I was home with the two little girls, and it had some problems. He was lonely and he was thinking of coming home, until he got this trachoma project going. My parents were back for part of that year, and that helped a great deal. My parents and I, with the two children, left for Arabia via India in September of 1957, because that was the full year and I wanted some time in India. I had left in 1944 at the end of high school, and had gone to Oberlin College for four years, and then met Roger in a very interesting--I'll stop briefly to tell you that, not that you need it.

Hicke: Yes, please do.

Background on Roger and Elinor

Nichols: During our junior year, he was at college at Cornell College in Iowa, though he'd been to Columbia in the V 12 program, and he'd been to--he always said he went to five of the best colleges in the country, because of V 12 and moving around. So during our junior and senior years, I was at Oberlin in Ohio; he was at a little Methodist college called Cornell in Mt. Vernon, Iowa.

Many years ago, before that--we're talking now '27--people by the name of the Baldwins, again this is kind of an aside, had been missionaries for thirty-five years in Burma. They came back to this country, having been very impressed by how people of different religions and different races lived and worked together in Burma. There weren't many conflicts; so they thought, "Well, the way to get the world on track is to come back to America and we'll set up summer camps which will be experiments in international living." And they had one in Glen Falls, Finger Lakes; they had one outside of Denver, up in Golden, [Colorado], up in the Rockies just outside of Denver. They actually ended up with one in Japan; they had one in Denmark; they had one in France. My brother had gone to this in 1946. My brother was a doctor; he graduated from Case Western in 1948. He told me what a great experience it was.

So I hitchhiked from Oberlin to Colorado. In those days you weren't supposed to hitchhike, but we all did it. I nearly got thrown out of Oberlin because I hitchhiked once with another girl, and it was illegal, and the dean of women was terribly upset. She said, "Your parents are in India. We're your

parents; and you can't do this." And I said, "Well, gee, I have no place to go and I wanted to see Niagara Falls;" so my friend and I hitchhiked to Niagara Falls.

Anyway, so I hitchhiked out to Denver, and Roger came out on his red Indian motorbike, which in those days, was the biggest motorcycle on the market--Big Red, they called it. This camp was in an old Boy Scout camp with a swimming pool and dormitories. There were fifty international students and there were fifty American students. And we spent six weeks together, going out on so-called deputations in small groups of three to four. We worked in prison camps; we worked with the migrants; we all had different jobs; we worked in the Methodist Youth Camp; I don't even remember the whole list. We'd spend four days out there, working in small, carefully chosen groups.

Then we'd come back for three days and sit around and talk. What were the problems? What was the antagonism we felt? And it was like a cell group--terribly artificial in a way--but wonderful for young people. All the girls lived in one dormitory, and all the boys lived in another. We went swimming and so forth. But it was artificial; and only the Americans learned from it, I think, because the ones from all over the world were already in a country, which for them was a foreign country. And I have to believe that they sort of tried to make their way carefully lest they irritate their host country.

But the first night, Carole, we sat around this huge circle with a big fire in the middle. I was very shy; my father was a brilliant preacher and a brilliant storyteller and a brilliant speaker, so I grew up cute but very quiet. So we sat around the circle and they announced that everybody had to stand up and they had to give their name, where you're from, and where you're in college. And I just died. I mean, it started over here; I'm here; and Roger is over there. And they started to come around, and I quickly thought, "Well, what in the world can I say?" So I stood up and I said, "My name is Elinor Potee. I am at Oberlin College, a junior-senior. And I was born and brought up in the jungles of Central India." And I sat down. I thought, "Oh thank goodness. I hope nobody speaks to me again."

Well, it went around; everybody stood up. And then, right across from me, this tall, thin, butch-haircut guy stood up, looked me right in the eye across the fire and said, "My name is Roger Nichols and I'm at Cornell College, junior-senior; and I grew up in the jungles of tall corn in Iowa," and he sat down. And I was mortified! At least one person is really making fun of me. But it was an interesting thing that happened that first night.

Hicke: He wanted to communicate with you.

Nichols: Well, as it turns out, he was so popular all summer because of his red Indian motorcycle--every girl in town fell in love with him. But, the Baldwins put the two of us together--why, I will never know--in two of the six deputations that went out. So we actually had some time to work together. I learned a lot about him. This boy, at that point, was the head of all the Methodist youth in the state of Iowa. He was very good with groups of people. I fell madly in love with him; and that summer really destroyed me, because he was so busy with all these other girls. Why he had picked me out across the circle and then spent the summer ignoring me, I guess I'll never know, so. So that was my first agonizing experience with unrequited love.

He went back to college, and I went back to college. It ruined my senior year. I mean, I just broke off dates with people: I had one boy that I had dated all through high school in India and had dated through college, and would've married him. His name was also Roger, Roger Evans, who became a surgeon. I broke up everything and just cried every day, and waited for a letter.

I finally got a couple of little letters from Roger. I believed, because of my background with letter writing, that we could develop a relationship through letters. And he, who'd never written a letter in his life, practically speaking, just said, "That is absolutely impossible," and so he didn't want to continue this. In the spring, I wrote to him and said, "I have four guys wanting to take me to the junior-senior prom. And I'm just telling you. I'm coming out of my isolation and I'm going to the junior-senior prom." I just couldn't live like this any longer. Well, he didn't even call me; he got on the road within an hour of the time he got my letter, hitchhiked thirteen hours from Cornell to Oberlin, and turned up at the dorm door, knocked on the door and said, "I want to see Elinor Potee." And they said, "Well, she's dressing for the prom." I came downstairs, and here are my four other suitors. [laughter] Interesting. Of course, to have him there, the implications of that were clear. So he and I went. I don't know how I got out of all of this.

But then we decided we didn't really know each other very well, so after we both graduated, he came to Oberlin for a year to take a pre-med course. He'd been a history/math major at Cornell, and his mother had always said, "Oh, you have such wonderful hands; you'd make such a good surgeon." And that so turned him off, he just wasn't considering medicine. But at that point, he felt, "Well, if I marry this girl, I would go into medicine--because that's really what I've always wanted to do."

So we had an extra year on a campus together, which was helpful for both of us to get to know each other. But if I may throw in a tiny story--?

Hicke: I'm always interested in stories.

Nichols: We were walking along a road in Oberlin one day. We stopped in the middle of it. And he said to me, "You know, I have to tell you: I have a real problem. I really hate your name." And I laughed. I thought it was a lovely name, Elinor. I looked at him with horror and said, "Why do you hate my name?" He said, "Well, there was this girl on a neighboring farm where Frank and I"--his brother--"were growing up in the thirties. She was horrible: she had buck teeth; her nose was always running; and she had dirty and stringy hair. She followed us, and she was always sneaking around and watching us 'skinny dip' in the creek. And we hated her, we just hated her. And that was Elinor!" And I said, "Well, that's a good enough reason for hating a name!" So we decided right there: I said, "What do you want to call me?" He said, "You're little and you're petite and Sue is a nice name. So I'll call you Sue." So I said, "Fine. That's fine." So that was the Oberlin year. I graduated in 1948.

The summer of '48, he was in Iowa helping his parents build a house in town--they'd left their farm--and he cut off his thumb in the big saw by mistake. He couldn't do any work for a while. So again, without telling me--I was in Cleveland with my parents who were back here, so we were living in an apartment--he hitchhiked to Cleveland to see me, because he couldn't work for a while and he was in lots of pain.

He knocked on the door of my parents' apartment in Cleveland; and I was downtown at a Methodist youth convention for 12,000 young people. We weren't Methodist, but for some reason I was down there. And he knocked on the door. My mother knew that I was terribly in love with this young man and at that point he wasn't all that interested in me; and she couldn't believe it. Since first grade I'd had little boyfriends, and she was really quite upset about it. So she was home alone and he identified himself; she invited him in and they sat there on the sofa. My mother was tiny, and she was sitting there, looking at him. She said to him, "Roger, I understand you don't like my daughter's name. I'm just curious." He didn't even know that I'd told her the story. He said, "Well, let me tell you the background on that--if Elinor hasn't." So he said, "When Frank and I were growing up, there were two girls"--he'd never said this to me--"there were two girls, in the farm area, and we really despised both of them. One of them had buck teeth, the other one was always dirty, had a runny nose. And they sort of took turns

spying on us; they just tormented us as we were little boys growing up. We hated them, we just hated them!" My mother was listening very quietly. And then he said, "One girl's name was Elinor and the other girl's name was Esther." Well, my mother pulled herself up to her full five feet two inches, and she said, "My name is Esther."

Hicke: Oh no!

Nichols: It was tragic that the man I eventually would marry, having had only two girls in his background whom he really hated, and to have them--tell me, Carole, if that wasn't a connecting coincidence, well! As he always told that story at the parties, he said the relationship with Mrs. Potee went downhill from then on, which was not true. But the chances of that happening--. But he'd never told me the story about Esther. He didn't know my mother's name was Esther. He never mentioned the second girl. That did sort of make it hard for my mother to recognize him as a viable suitor. [laughter] But anyway, we worked a lot of things out during that last year, and we got married, as I told you, in August of 1949--both having been accepted at graduate schools in the University of Iowa.

So, then you know why we went to Saudi Arabia. I went out in September of 1957. I went to India and spent six weeks with my parents, which was nice, because I hadn't been back since 1944, and this was now '57. Growing up in India, I learned to speak Hindustani before I learned English. For years, I dreamed in Hindustani. And I really didn't want to leave India when I left in 1944, anyway, because it was a magical childhood in the jungle. You know, we were in the Seoni Hills: if you've ever read any of the Jungle Books, Mowgli stories with the Rock; Council Rock is laid right in the Seoni Hills. We had pet mongoose, "mongeese," Rikki Tikki Tavi. We had pet pythons. The black panther Badura was there. Everything was there; it was all part of my childhood. So it was a magical childhood.

Then after six weeks with my parents--and I think one of the letters here describes going back to Arabia--. And by that time, they'd found a house; and so I got there, I think, in November of '57. Now, I'm going to stop talking, because that's up to the time that I'm now with Roger in Arabia.

Trachoma Research: Isolating the Infectious Agent

Hicke: Okay. I want to ask two things: what were your first impressions of Dhahran? And the second is what was Roger doing?

Nichols: At that point, he was running the trachoma lab, as I remember.

Hicke: What was his day-to-day routine?

Nichols: Well, I was hoping Dottie would tell you more of that. There may be more in the letters as I send them to you. But when they went to Saudi Arabia, they didn't know what trachoma was. They really didn't know. They had never isolated it as a disease: they didn't know how it was carried; they didn't know whether it was a bacteria; they didn't know whether it was a virus. So there was some basic research that had to be done.

The first year Roger was in charge of trachoma--first year--he and his lab technicians collected 10,000 flies, and they had a special name for them. When you go to Arabia, there's this tiny little fly which is in everybody's eyes, because the fly lives exclusively on the mucous in your nose and the tears. When the babies are born, immediately flies are around those eyes; and they are so covered that the mothers don't even bother to do this [brush them away]. In fact, Roger would examine the babies' eyes at three months, because many of them had trachoma by that time--three months. He found dead flies in the eye; I mean, they're everywhere. So naturally, they assumed that flies must be what was carrying whatever this disease was. Well, they found absolutely no evidence; it was not being carried by flies.

Then they had to figure out what the disease was. So they went out into the villages and there is some in here and I'll send you more about which villages they went to, and I've got some pictures of them working in the villages, which I will get developed and slides for you--and they would scrape the children's eyes--it's inconceivable now--scrape their eyes and you have to grow what was in the eyes in something. Now, in those days, there were no chickens in Saudi Arabia. The best way to grow living tissue is in fertile chickens' eggs. And now here we are in a country where there are no farms and no chickens for all practical purposes. So Roger was telegraphing and radioing Harvard to get huge boxes of fertile chickens' eggs and send them out to the laboratory. Well, it was very odd, Carole. Not a single box ever got there. A whole bunch of boxes got to Cairo, and somebody, by mistake--in the middle of the summer--unloaded them from the refrigerated area, left them on the tarmac where the sun was 150 degrees, and they fried. So then he said, "Well

then, we can't do it that way." Didn't Dottie mention this, about the chicken eggs?

Hicke: No. She told me they were using chicken eggs, but she didn't tell me anything about that. That's why it's good to get stories from different people.

Nichols: So then we tried to send them through the Hague--Aramco had an office in the Hague--and something went wrong with that. Now this is anecdotal--I don't have anything in writing that I have found, but it's going to be in some of my letters. What I find in my letters and send to you will be more accurate than what I tell you right now, because I wrote the week it happened. And so anything you find in my letters will be more accurate statistically, Carole, because this is a long time later.

So, darned if those huge boxes of fertile chicken eggs didn't get unloaded by mistake in the middle of the winter and left on the tarmac. He could not get huge supplies of chicken eggs in. So then they started to fly in human tissue, vials of living tissue. And that was very expensive. They also brought in sterile mice, which had to be flown in, which had to be dealt with. Maybe that was when they started working on the vaccine. Yes, I think the mice came later. But while they were trying to grow whatever trachoma was in the very expensive vials of living human tissue, one of the graduates of the Harvard School of Public Health--

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Nichols: --who was a Chinese, and I cannot remember his name--[This was a Dr. Tang. There was also someone at Aramco named Bob Chang--he was from Harvard.]--working in China, using eggs, isolated trachoma. When that hit the world's press, in the medical world, it was a terrific boon. Because now that we knew what it was, and it's a very--and I can't explain it to you though I've heard Roger explain it many, many times and I'm sure it's in the material that you can get.

Hicke: Yes. I think it's in the papers that were published here.

Nichols: Okay. It's an adenovirus: it's partly virus and partly bacteria; and each of them behaves opposite from the way they're supposed to behave. In fact, syphilis and a lot of these things are related to trachoma, and they found all of that out. Unfortunately, that Chinese doctor who was so brilliant was picked up by the Communists and put out on a work gang and died out there, even though he made this major contribution when he did.

Hicke: Dottie told me some parts of this, but you're giving me something different, actually.

So this was a major breakthrough.

Nichols: Without that, you couldn't develop a vaccine.

Hicke: And then you didn't need the eggs anymore.

Nichols: No, no. And at that point, farming was coming in Arabia and we could get chickens' eggs. After that first year of 10,000 flies, and then they tried the chickens' eggs--and I cannot tell you how long they tried to get chicken eggs out there. Again, I think it will be in some of my letters. I'll never forget him saying. "Those flies--10,000; chicken eggs on the tarmac at Cairo!" It was frustrating. And obviously, he, Roger Nichols, would love to have been the one. If they could've gotten chicken eggs in, he would have done it. But fortunately for them and Harvard, it was a Harvard graduate who was in some village or some laboratory in China.

The Next Objective: Developing a Vaccine

Nichols: The next big project for Harvard--and I think they must have gotten more money at that point from Aramco--was to develop a vaccine. Once they'd found what the disease was, they started working on vaccines; that gave them something big to work on. The first thing they had to find out: is it just one trachoma, or, like the flu virus, were there 150-250 strains? If there are 150 or 250, it's going to be very difficult to come up with a vaccination. You can't do it: you can't put more than four or five into one vaccine, evidently. So they started scraping eyes and growing this stuff. I have his definitive book at home--I have two copies; I should have brought one in for you--which is the publications of all the papers, at that time, on trachoma.

If you think you need the book¹ for the articles, I will send you a copy of it. It probably ought to go in the file in Berkeley.

¹Roger L. Nichols, ed., *Trachoma and Related Disorders*, Proceedings of a Symposium held in Boston, Massachusetts, 17-20 August 1970, Excerpta Medica, 1971.

Hicke: We should deposit it with the oral history volume, yes.

Nichols: I think, as I remember, they isolated four major types of trachoma. Roger flew to Australia, where the Maoris live. Oh, let me go back a little bit. Trachoma only exists in countries where the standard of personal hygiene is low. If you don't have running water and you don't have towels and you don't have soap, and you're all living close together, then trachoma is rampant. The Indian villages in this country, in the Bible Belt in America, have quite a bit of trachoma. The primitive tribes in Australia, also. He flew to the Masai reservation in Africa. In all of these places he was collecting; and I'm sure in that book it'll list all the places that Roger went, personally, to collect, scrape eyes, and bring this stuff back and grow the adenovirus to find out if there was a difference between each thing, because that was crucial. Once they got their four strains, what I cannot tell you is, did they try to mix these strains into vaccines? I don't know how this, and Dottie's got to be able to tell you, because she was his prime investigator on this, or prime hands-on worker--very good lab technician.

They did come up with four vaccines, and they tested all of them on--I can't tell you again on how many children. And all of them had a bad side effect that just scared Roger. One of them caused big boils; and you know, the last thing you want in a country where hygiene is low is a boil on a three-month old baby. None of them [vaccine protection] lasted more than six months, as I remember, which is like the cholera vaccine. We had a friend in the team die from cholera because, even though they'd taken the vaccine, they went back to Egypt several months after they'd had it. So, it was a very, very tricky vaccine. They worked and worked on it; they would go out two or three days a week, load up the Land Rovers at dawn with all of the equipment--and I will send you pictures of this--go out to various villages.

Now, it was difficult, Carole, because they didn't want to treat all these people. I mean, it's easy to treat trachoma: you give them sulfa drugs and they get well. But the reinfection rate if the patient remains in the same situation is 100 percent. All of the Arabs in those days were sleeping on a mat on the floor; they were all sleeping together. A mother wears this aba, and she wipes her eyes and she wipes Fatima's eyes and Mohammed's eyes. They have no running water, no towels, and no soap, washing in a ditch going through the village. So even if you got trachoma and you were treated for it, if you go back into the same village, you're going to get it again in six weeks. They had to come up with a vaccine--like Roger used to say, "We need a vaccine against syphilis all over the world. Every two-year-old in the world should be given a syphilis vaccine." Well, we don't

have one; so then, every ten years--. These are tough diseases, because the reinfection rate is so high if your contacts continue. Roger and Harvard felt that none of the vaccines could go on the market because they just weren't good enough; so they continued for many, many years to work on a vaccine.

I will break the chronology with another story which you may find interesting. Somewhere in my letters, I will find the date. We flew to Asmara, in Africa, early on--we must have gone over there in '58--to see what the Italians were doing, because if Harvard's doing research on a particular disease, it's important to know what all the other laboratories all over the world are doing. So Roger went to Lister Institute in London, and he had a lot of work to do with them. They were working on trachoma, too. We went together to Asmara. The Italians were working on vaccines by this time, so it had to have been after the isolation of the disease. Roger was not terribly impressed: he thought some of their methods looked pretty haphazard.

Well, somewhere in the sixties--we went to a lot of parties out there, because that's what everybody did for fun--and this tall doctor, an Arab, came up to me--I can't remember his name; it'll come in one of my letters--and he was very arrogant. We all knew him very well. He said, "Well! You Harvard types think you're so smart. Let me tell you what's happening: the Italians have come up with a vaccine. The King is going to buy all the vaccine they have, and we are going to vaccinate every single person in Saudi Arabia for \$4 million [or something], and we're going to wipe out trachoma in Saudi Arabia." So I said, "Gee, that's marvelous, doctor. That's really wonderful. Poor Harvard." You know, we sort of laughed and he stalked away.

When we got home that night, I said to Roger, "I'd like to tell you what I heard at this party." So I told him; and of course, he was horrified. Now the question was: how to get over to Riyadh and talk to all the medical people over there, including the King--I bet it was King Faisal at the time; I wrote this all to my parents; I haven't touched these letters--and how to do it without antagonizing everybody. Finally, he got in touch with them. He said, "You know, I feel bad. I haven't kept you all current with what Harvard is doing. I'd like to come over, you pick the day, I'll bring all of our material with me, and spend a day with all of your medical people, the Ministry of Health and the Ministry of Education and so forth. And I'll just tell you where we are."

And he did it brilliantly, I guess. He went over there with all of his documents, all of the information about their vaccines--didn't mention the Italians--where they were, what the

problems were with each of the vaccines. He may have mentioned: "Other labs are working on this, and we are nowhere close to having a vaccine that I feel is safe enough to announce to the world." Then everybody listened very carefully, and after a full day of this, he closed up his book, and everybody thanked him. He came back, and we never heard anything more.

But the chances of my being at a party where this man was-- because it was a big secret: nobody was going to know about it; the King was going to do this, sort of, without saying anything. But the Italians were going to make a huge amount of money. This is another one of those serendipitous things that happen in life, which you look back on in life and say, "Boy, I'm glad he picked me out." Because if he had said it to anybody else, it wouldn't have gone back to Roger.

Hicke: And Roger's trip over there, then, made them realize--

Nichols: Oh, yes, absolutely. Roger didn't say a thing about the Italians. They'd made a terrible vaccine! It was absolutely worthless, because they had changed all of their data. It was all dishonest: it was bad data and we found that out when we went out to Asmara. They didn't follow it up; they wrote up what they wanted it to say, and they had no provable lab background to show that this was true. So Roger knew that they couldn't have a vaccine.

Hicke: It was out-and-out fraud?

Nichols: It was out-and-out fraud. They were just going to sell the whole thing. Also, what Roger said to me was, "Okay, the vaccine was no good. But if they would have vaccinated every single person in Saudi Arabia except one grandmother in the back of the Bedouin tent whom everybody forgot or she didn't want a shot, and she had trachoma, it takes just one person to start it right back through the entire Kingdom."

And it's the same thing with syphilis. If you vaccinate the entire world--and they don't have a vaccine against syphilis--and there's one person, anywhere in the world, who still carries syphilis, it will start again, because of the way syphilis is carried. So it was interesting; actually, syphilis and trachoma are very close. But, you know, be a little careful, because I don't know the medical part of this and Phil Gelpi may know it.

Hicke: That is interesting. You really saved the day.

Nichols: Well, he saved the Kingdom from a very foolish, expensive mistake. But it wouldn't have hurt anybody, probably.

Hicke: You said he had found some very bad side effects from the vaccines he was working on. So maybe side effects might have been a problem.

Nichols: I don't know. Once it was done, we just kind of held our breath waiting to see if anything would happen. We didn't talk about it in Aramco. Dottie may not even know this. It was an embarrassment for the Italian laboratory, I'm sure of that. So that was the end of that. Now, as Roger always said, "We still don't have a vaccine." With the easy diseases, you get vaccines fairly quickly; but it took sixty years for the polio vaccine (Salk) to be developed. And trachoma and syphilis and related diseases are so tough that although they started this whole program in '58-'59, the world still does not have a vaccine. And the world's major labs are still trying to find it. You raise the standard of living and it is wiped out, by definition of it being a disease of low hygiene.

To develop these vaccines, they were using donkeys at the Hobby Farm, which is where the horses were in Aramco. Our daughter had a horse there. They were putting live trachoma into the donkeys, and taking the blood out, using what was in the blood to try to make a vaccine, which is how you really make vaccines. You take a little bit of a disease and you put it into a vaccine: your body builds up antibodies; when a disease really hits you, then you've got these cute little antibodies running around, saying, "That's mine. Let me have it." And that's what they were doing with donkeys, putting it in and taking the blood, using that to try to make a vaccine.

Nichols Gets A Case of Trachoma Himself

Nichols: Well, on one of his trips--it was about March of '65--the donkey didn't like having blood drawn, and they had four-five people holding him, but he kicked--and a vial of pure, virulent trachoma splashed up into Roger's eyes. These are what are known as "laboratory infections." Of course, they washed it off. But he came down with a terrible case of trachoma and we all had to be careful. We couldn't use his towels, we had to use a different bathroom, we had to sleep separately, we didn't touch him, and he became an outcast in the family. But it's easy to treat it: you take sulfa.

The problem was that we were leaving two weeks later for Kathmandu; he and two other doctors were going to trek across the Himalayas into base camp at Everest. Now, sulfa is a very bad

drug: you have to drink about eight glasses of water a day to keep washing it through your kidneys, otherwise your kidneys seize up and you have real problems. He was going to trek 8,000 feet up, 8,000 feet down for three weeks from Kathmandu, and there was no way he could carry enough water to drink eight glasses. I mean, it was a terrible problem. But it was a wonderful trip; it had taken us weeks to get permission from the Nepali government.

So we went over anyway. I went over early with the two girls in '65, because I speak the language, though I didn't realize that all the Nepalis also speak Hindustani. So I found the sherpas, two sherpanis--four of them--and got all of the equipment bought using my Hindi. And then three doctors came over: they had three weeks; that's all they had, so they had to really set right off; the three of them.

Hicke: He went?

Nichols: Yes, he did. He took his chances. He took sulfa, drank as much water as he could. He just couldn't bear to give up the trip, and somehow, I can't remember the sequence, but he didn't do the damage that he might have.

Hicke: Did you have your nails chewed down to your elbows?

Nichols: Oh, beside myself! I kept saying, "Roger, how can you? You're so intelligent. You know more than anybody in the world about trachoma, and you're telling me you can take--?!" But he said, "Well, don't worry about it, Sue. I know what I'm doing." I didn't argue with Roger. He was so much wiser than I was, and he was a medical man, and I just had to trust him. So he had a wonderful trip. It worked out.

Hicke: Happy ending.

Nichols: Yes, it was a happy ending. When they got back to base camp, they found some others who were planning an assault on Mt. Everest. This was '65, before a lot of people had climbed Everest. Roger was a very good mountain climber. The leader asked Roger to go up Mt. Everest with them. He wanted to go so badly, because they had all the equipment. But these three doctors had a date to get back to Aramco, and they just felt so strongly about being back on duty; so they didn't go, and they flew back out in [Sir Edmund] Hillary's plane, which came in at the same time Hillary came out. The military commander of the Indian team got to the top, and so he wrote a postcard, sent it in by runner; he was three weeks running, literally running all the way from base camp to Kathmandu with this postcard; [he] gave

him money and told the guy, "Put a stamp on it." Because Roger had left his card and it [the postcard] said--I still have it someplace--"Dear Dr. Nichols: We made it to the top. You should have been there with us." But it was so sweet because they did make it to the top and they remembered that he'd liked to have gone. It was all crinkled and wet; you could barely read it. But this guy had strapped it to his body and run. I mean, we're talking literally 8,000 feet up and 8,000 feet down. You're going across the Himalayas, higher and higher. So I thought that was really quite amazing.

Hicke: And they made it back down, too, I take it.

Nichols: Yes, yes. It was a regular assault, so they made it.

Other Medical Personnel

Hicke: Okay, well how about some of the other people that he worked with; can you tell me a little bit about them?

Nichols: Jack Snyder--he lists in here how many times he came out. I think they came out almost every year. Roger went back to Boston a lot. Again, this will be in the letters. I can't remember if he came back because it was easier to do a lot of the lab work at Harvard, which had better labs and better equipment than Aramco, as I remember. One time, I noticed in one of the letters, he went back for three months. But he would fly back, I think, three or four times a year, bringing vaccines back and refining the process and so forth. So Jack Snyder, who was dean of the School of Public Health at this point and still head of the Microbiology Department, kept in close touch with all of us.

Sam Bell, who has died, was with Harvard; he must have been on the research team. He was at the School of Public Health. He flew out. He was the one who originally came out to interview Roger.

Ed Murray, who has also died, was a brilliant physician. Somebody ought to have information about him. He had been in Turkey on horses, and he had ended up, by mistake, in China and was put under house arrest. He had a history, and I don't know whether Ed Murray's history has ever been written up, but he was a fabulously interesting person. In fact, after a year or two of being kept in house arrest in some little village, I guess he wrote to--

Hicke: A year?

Nichols: Oh yes, it was incredible--very tough story. He wrote to somebody high up in China and said, "I am going to write to President Roosevelt and suggest that he write to you and arrange for my release." Somehow, this made them think, "Oh, this guy really knows the top man, so we better do something," so they let him out. Ed Murray had been with Harvard for quite some time, I suspect; but he had, like Jack Snyder did, a terrific background of work in Egypt, Turkey, and China. They worked on some of the diseases. Jack Snyder is working on his autobiography. You got his CV?

Hicke: Yes.

Nichols: For us, he has been terribly significant, because he's really been Roger's mentor from the beginning. He was the one who knew about Roger being in Saudi Arabia, even though I don't think Roger had worked with him at the School of Public Health; and he sent Sam Bell out to ask Roger if he would do it. So he got us into trachoma. In 1970, he was head of Microbiology, and though he says this is not true, he's the one who recommended that Roger be brought back from Aramco to become full professor and head of the department of Microbiology at Harvard School of Public Health to continue the trachoma research.

III POST-ARAMCO ACTIVITIES

Nichols Becomes Director of Boston's Museum of Science, 1982

Nichols: In 1982, the director of the Museum of Science, Brad Washburn, had retired after forty-nine years. They had one director for a year, and they had to fire him, worked for nine months. Then there was an interim director for a year. Brad went to the search committee and said, "You know. I wasn't a scientist"--he was a mountain climber and a cartographer--"Why don't you guys go looking for a real scientist? Why don't you go looking for a doctor, somebody who really knows some science?" And the search committee said, "Well, you're so blankety-blank smart, Brad, you find us a doctor." So Brad Washburn called Jack Snyder and said, "The position for director of the Museum of Science is open. Do you have any suggestions?" And Jack Snyder said--third time: "The smartest, most intelligent, energetic man I've ever known in my life, who's a doctor, is Dr. Roger Nichols."

Hicke: Never changed his mind.

Nichols: You see, that year was very interesting. Roger was a magnificent teacher, Carole, absolutely stunning. He would get a standing ovation after every class. He was just incredible. I sat in on quite a few of his classes and helped him with his slides. That year, 1982, he was the first professor at the School of Public Health who had ever received a Best Teacher of the Year award from the students. And the same year, he was given the Best Teacher award by the faculty.

So when Jack Snyder said that, Brad Washburn said, "Get in touch with Roger Nichols." They got in touch with Roger.

Founding the University Associates for International Health

Nichols: When we came back from Saudi Arabia--our work with Saudi Arabia after we left was actually an interesting continuation of Roger's time out there. We started an organization called University Associates for International Health. We started it in '71, when the government of Saudi Arabia decided to go to American University of Beirut School of Public Health to see if that university would combine with the government of Saudi Arabia and study the country. They'd pay anything they wanted. It was such a huge task that the American University of Beirut said, "We can't touch it."

Then they went to Johns Hopkins [University], to the School of Public Health, and said, "Please help us with this Kingdom problem." And they said, "Can't touch it. We don't have enough faculty. We can't touch it." They went to Harvard School of Public Health. Now this was after Dean Snyder, who resigned in '71, soon after we got back, which was most unfortunate. He and President Pusey at Harvard both resigned in September of '71, and we came back in September of '70. That was a time of the student uprising, and they were taking over the campus. Both deans had been there about eighteen years--the president of Harvard and Dean Snyder--and they just said, "This is a younger age. We don't want to handle this. We've done a lot." So they both stepped out, which was very difficult for my Roger. [Comment about new dean of the School of Public Health not transcribed.]

Hicke: That's probably already in the public record.

Nichols: It may very well be. And I don't even know whether I should mention it to you.

Hicke: Well, Dorothy mentioned it.

Nichols: Roger was so upset, he went to John Dunlap, who was dean of Harvard College at that time. John's a lawyer, and John said, "Well, it's an easy solution, Roger. Get a couple of faculty from Johns Hopkins, you and Dick Daggy, as the ones from Harvard, and a couple guys from the American University in Beirut. Put together a corporation. Go back to the King and say, 'Okay. It's such a big job, no one school can do it.' Don't even talk about the reasons. 'But we are now a nonprofit corporation: we have six top physicians from these universities. Isn't that better than just one? We can do it.'"

So that's what Roger and I did. We incorporated University Associates for International Health. I think it was in '73. Well, that's a long story, but I'll go through it quickly.

Hicke: No, we have plenty of time.

Nichols: We took a team of fifteen out to Saudi Arabia for sixteen weeks. We lived in a hotel in Riyadh. We flew all over the country, and studied all of the health problems and came up with a--which I still have--a huge report. It took us six weeks to write it: a twenty-year project for Saudi Arabia, run by University Associates. It was a \$27 million project. The first thing was a survey of all the villages, what the diseases were. And then there was a plan for training manpower: you had to have nurses, dentists, paramedicals, and doctors. There was one medical school in Riyadh at that point.

It was a marvelous project, Carole. The Report Plan was done in Arabic, and in English. We carried it all out to the minister of Health out there, and the King, and they were so excited about it. And then King Faisal was shot. King Faisal was our king; he was the one Roger had been working with. The minute King Faisal was shot, Roger must have known we were in trouble. They changed everything, because everybody coming in charge wants to have his own men working with him.

The new minister of health had come from agriculture, and he'd been trained in England. He wasn't a physician; he was a Ph.D. in agriculture; and now he's minister of health. So here they have all of our material, and we're waiting to hear. In fact, we were within a week of signing a twenty-year, \$27 million contract to do everything--tell them where, when to build hospitals, new medical schools, and everything. It was really exciting. And the King was shot.

The minister finally telexed us and said sort of, "Don't call us. We'll call you." That was a real heartbreak for us, because we knew that this group could do it. I mean, we had just terrific people working with it. At the same time, Roger was out there negotiating this contract, the minister of Higher Education heard that he was there. He made quite a name for himself with Aramco, because he was working on trachoma; he was going over to Riyadh; he treated the old king for trachoma. And so he was well known and well respected outside the Aramco circles, because he was articulate; he just came across well. He was out in the villages; he knew all the sheiks, up and down the country; we were out with the Bedouins. He was just known by a lot of people.

The minister of higher education had been a Bedouin. He didn't speak any English and he worked with translators. So he said to Roger, "I want to build another medical school. And I want you to help me."

Roger said, "Your Excellency, I cannot help you."

He said, "What do you mean you can't help me?"

He said, "You don't need another medical school. This is a country of 3 million people [in those days]. You've got a good one in Riyadh; that's all you need. You don't need brain surgeons."

So he said, "Well, explain to me what I really need."

So Roger said, "What you need--and I would be happy to help you with what I can do; my interest is in the people of Saudi Arabia--you need a health sciences university. You need one that turns out doctors, nurses, paramedicals, and dentists. And they should be staggered in such a way that all of them come out of school at the same time, and then you've got a primary care health team."

And the minister said, "Well, that makes good sense." And so he gave us a contract to study the situation and prepare a proposal. Then we worked on something else again. We took another team of ten people out there for six weeks to work on how we could do this. Then we started--

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Nichols: --the University in Damman. Now, this is not part of Aramco, but because of our Aramco background it was easier to do. Roger and I were the only staff. Roger was working full-time at Harvard, but at five o'clock he would come to our offices near the children's inn. The first job given to us by the chosen dean, who was Dean Al Turki, was to place nine Saudi physicians in American internship and residency programs. These physicians would be on contract to be the professors at this university eventually. They'd all gone to school in France, or they'd gone to school in Germany, or in Ecuador or somewhere; but the Saudis really wanted an American graduate training for these people. Mind you, we didn't get any money up front. The Saudis were very slow about giving us any contract money for a variety of reasons. They just didn't think money was important when they had so much of it. So Roger, of course, was a volunteer, and I was a volunteer, too.

The first job he gave us was to find internship and residency programs for these nine physicians. Well, every afternoon at five I would go over to Harvard, having gone to the library and gotten the names of the heads of departments of every residency in America. The Harvard Library has a list of the heads of every teaching hospital in the country. And then Roger would just start dialing through them, and explaining who he was and what he was looking for. To sweeten the pot, he went to Dean Al Turki and said, "Look, Dr. Al Turki, by the time you come to me, all of these positions are filled. May I make a suggestion? Would you be willing to offer a \$5,000 yearly gift to the department of the host university? That would help them, because their English was bad and that'll help them make the adjustment to the extra time that we want your young men to be given."

What Roger would say to the host universities was, "I can guarantee you, 100 percent, that every one of these young men will go back to Saudi Arabia." That was very attractive to the departments, because the Indians come over and they never go back. They end up doing very well here, and they're good doctors, but they never go back to practicing in their own country. And it upsets Americans because they like to feel they're training third world country doctors who will go back and help their own countries. Well, these guys were all on contract: they were going back; and they didn't even want to stay. So that was a promise; "and we'll give you \$5,000 a year, and the university in Saudi Arabia will pay for their housing. Really, you're doing this government which needs help so badly a tremendous favor." Within six weeks--and we worked for six weeks on this, every afternoon--he got all nine of them into top notch residencies, ob and surgery. That was a good way to start, because it gave Dean Al Turki the feeling that Roger and I could do something. They all began to realize very soon--the Arabs--that we wanted to help them with their medical training programs.

I loved Arabia. We just had a marvelous time out there. I'd be there still if he hadn't been offered the chairmanship of the department and a full professorship. He had an endowed chair at Harvard; as he said, "How can you turn down an endowed chair?" And he was right. I was wrong. I often was. Roger could look ahead. Saudi Arabia was an interesting place to live--all the things we did out there, traveled all over the world. We really had a very interesting time. Having grown up in India, Carole, it was very easy for me to be an expatriate, and to be a very happy and enthusiastic expatriate. I live overseas very comfortably. I may be an American, and now I've made my peace with living here, but having grown up overseas--whereas Roger grew up on a farm. So I think it was a bigger jump for him, but he learned to love it.

Anyway, after we got all of them into it, then we started looking for--and I won't keep on with this--a staff. We had to put a full-time staff of six of our own people out there as hospital architect, hospital planner, and so forth, educating. We did that, and they were out there for two years.

Hicke: This was in Dammam where you had the hospital?

Nichols: Well, nothing was created, you see. We were creating a medical school and all we started with was an abandoned building, which had goats, sheep, and camels living in it because it was on the edge of this small village, which is now a big town. The government took it, swept everybody out, and then my job--I was head of recruitment--was to find faculty.

They were going to do this on the English system. You come out of high school and you have six years of medical school. There's no college. The first two years are the basic science. So the first year, I went to the Harvard library, got the names of every chemistry department in the country, every physics department in the country, and so forth, and wrote to all the departments. I advertised in all the journals, Journal of Chemical whatever. They would put these things up on the bulletin board. The first year we had to hire faculty for chemistry, physics, anatomy--no I don't think so--and biology.

Worse than this, it wasn't just one medical school. We had to have two separate medical schools: the boys had to be in a separate building taught by men; and the girls--and they wanted to bring girls into it--had to be in a separate building taught by women. And if you think it was hard to find men to go out to Saudi Arabia for two years, finding women who wanted to go out there, knowing the customs were different--it was tough. Fortunately, or unfortunately for all of them, I loved Saudi Arabia. So I was the best ambassador they could possibly have. It might not have been very straightforward. I mean I didn't mean it to be deceptive, because we were living in Aramco. We had tennis courts and swimming pools. They were going to be out there in a small town, with an apartment and not much in the way of facilities. And we told them that.

So the first year we got a faculty for both girls and boys. The next year we had to add the second year of pre-med. And then we went right on up through the six years, bringing in physiologists and anatomists and everything like this, flying back and forth. That was very exciting.

Hicke: A major project.

Nichols: It was wonderful. Four times a year we would fly to Houston, Roger and I, because the university rented a whole floor; and that's where they wanted to hold their interviews. Roger made them come over and interview all of their prospective staff. There was no way we were going to be held responsible; because if they made a mistake and somebody was really a mess, our feet would have been held in the fire. So the dean came over, and the vice dean, and Roger sat there in this room. I'd bring eighty people in from the entire country, gave them half hour slots, took Polaroid pictures so that at the end of every day, every week you could sit down and say, "These are the four for surgery"--you wouldn't remember who they were unless you had a picture.

The dean and vice dean would find somebody charming, and they'd want to choose him; and then Roger would say, "Well, now let's look at their background." Then Roger would come out to me, and say, "Give me any little dirt that you have." Out in the main lobby we picked up a lot of information. I could tell who was absolutely kooky very quickly. So with one guy--I'll never forget--whom the dean wanted to hire so very badly, I said, "Your Excellency, this man is mad. He's absolutely kooky." "No, he isn't." So I gave him the clues, and he didn't see it, because these were Americans or Canadians, and the cultural difference was too big.

We were on that contract for ten years. We got the school up and running for six years, and then they had to have a teaching hospital. There was a new hospital that had never been staffed. The government gave it to the King Faisal University. And I was still in charge of worldwide recruitment--worldwide recruitment, because the salaries were so low that we could only send American heads of nursing over. We had to go to the Philippines, Cairo, the Sudan, and India to get cheaper people--who were not very good--but they wouldn't raise the salaries for us. We got the teaching hospital up and running. It was wonderful.

Then when Roger became director of the Museum of Science in '82, he couldn't fly out there every five weeks, which is what he'd been doing with Harvard--flying out there every five weeks. In Saudi Arabia, they don't want to deal with anybody but the top man; they wouldn't even talk to anybody below Roger. So he had to conduct all negotiations and all discussions of problems. Now that just wasn't possible, because the museum was a very challenging job. We just simply closed up the contract. They were well on their way. We were just about at that time to start a big CDC [Centers for Disease Control, the federal government laboratory in Atlanta]--Kuwait had asked us and were going to

give us the money to start a CDC type major laboratory for the whole Middle East in Kuwait. We just had to write to them and say we couldn't do it. And they never did it. Then all of the Trucial Coast--little kingdoms, oil kingdoms, down the Gold Coast--asked Roger to set up a training program, continuing education for all of their physicians: their Indian physicians, their Bahraini physicians. That would have been another contract, but there comes a time when you simply have to pull out of something when you can't do it.

Director, Museum of Science, 1982

Nichols: When he became head of the museum, I lost the best job I had. Well, there was no contest. I just went in every day as a volunteer at the museum. But it was the time to do it. What we did at the museum was so spectacular, and it was just at the right time in his career, because he brought the museum from 850,000 people a year coming in to 1.6 million. He brought in these huge blockbuster exhibits. If he had lived, he would have made it the best museum in the world, I'm absolutely sure of it.

Roger did a lot of outreach programs that everybody said couldn't be done. Girls don't go into science--you know, at that time, 6 percent of the women were going into science, in '83--and he said, "We're going to bring Girl Scouts in for camp-outs in the museum; we're going to give them science taught by women; we're going to let them stay overnight; we're going to give them badges that give them free access for the whole year." The first year we had 3,000 girls; we're now up to 25,000 girls. And there's a backlog. The girls love it, and it makes a difference, because they see that science is fun, you can go into science and be a teacher--and the women teachers are marvelous. He had a lot of very brilliant ideas that everybody in the museum said couldn't be done; so he just went ahead and did them. Okay, back to Aramco.

IV LIFE IN SAUDI ARABIA

Raising a Family

Hicke: Let me ask you a little about life in Arabia, your own life.

Nichols: Life in Arabia. Well, I found it very interesting and very absorbing. Roger was out in the field three days a week, scraping eyes. I went out with him quite often. Our son was born in '61. We actually came back 1960 to '61, and lived in Belmont, because he wanted to finish his residency in internal medicine, and so we did that. And that was nice, and he did his boards. Then we went back. Aramco kept us on salary, which was very helpful. When you have two small children--the girls were two and four when we went out there--you're busy at home pretty much with the kids. Eventually--there's a little bit in here about it--I was head of the Girl Scouts for many years, and marched them out in the desert and had a marvelous time. Got involved with Sunday school teaching and Bible school in the summers. I just loved it, Carole. We took the kids swimming every day. Roger and I were in the desert--sometimes with the children--a lot. I even got to drive in Arabia, because we just wrapped my head in a red and white gutra. We had Land Rovers all the time. and nobody knows: if you meet a Bedouin, they don't know if it's a woman or a man. So we got way out in the desert, no roads, compass, and Roger would say, "You want to drive?" That was exciting and sort of daring.

Curing Trachoma: A Moral Dilemma

Nichols: I went with him on a lot of trips to the villages, where he was scraping eyes. But I started to tell you earlier on: the one thing that was sort of difficult was that if they treated all

these people with trachoma, then they were no longer useful to develop the vaccine. So we had a problem. You sort of had a moral problem here: are you going to treat all of these people who have trachoma, or are you going to use them to get a vaccine? And I'm sure that he must have treated--he must have--I cannot believe that through all those years, that they weren't also treating people. But the only way to do a study and to follow children is to go back out regularly and scrape the eyes and see what's going on. So I think there was sort of a moral dilemma there. And you'd have to ask Dottie, because I honestly don't know how they resolved that. Because we had to have real trachoma going on. Obviously, they'd never let people go blind from it; they would treat it before it got too far advanced.

Hicke: You also said the reinfection rate was so high that treatment was really not effective.

Nichols: Oh, that's right. They would get it right away again, which was almost worse for you when you repeat it. And some people got trachoma, didn't go blind, and got over it on their own. I don't think they ever found out what there was in anybody's body that gave you a spontaneous recovery from it. But in those days, it was what?--6 million people in the world were blind from it? Again, the statistics must be somewhere, but it was a leading cause of blindness in the world. When we went out there, Carole, there were three major health problems in the world: trachoma; malaria; and tuberculosis.

Hicke: You had them all.

Nichols: Well, yes, but those were considered by the World Health Organization as the three most worrisome. And they were all being worked on, of course. But I didn't know until we went out there that trachoma was so prevalent and that it was such a worry socially. Because if you're blind in a country, you can't work; and an awful lot of people were blind in Saudi Arabia. It [trachoma] hit them by the time they were three months old--if not earlier, you see. But again, if you raise the standard of living--give them soap and water--then it just goes. It goes of its own accord. It's almost faster to raise the standard of living, but it really isn't; it's not that easy to raise a standard of living.

Hicke: No.

Nichols: That's very difficult. But Arabia has done that with their oil wealth.

Hicke: Well, they have plenty of money there, so that made it easier for Saudi Arabia. But there are other places in the world--

Nichols: Oh, sure. Bangladesh and Pakistan.

So it was a good life, I thought. As a family, it was a safe place to live. We played a lot of tennis. We had swimming pools, little theater, good school systems. The kids had to go away to school after the ninth grade, but we sent Wendy, the second daughter, to the same missionary school I'd gone to in South India. She had four years there, which was great. Our first daughter went to Northfield, Mount Herman, in Massachusetts, and hated it. So we let her go--it was a good school, but she was so homesick--we let her go to India for a year. Great place to raise a family: partly it was great for us as a family because we were so active. We were in the desert with the Bedouins; we were following the tribes as they went from grazing area to grazing area. Roger was well known and welcome, and so we had some wonderful experiences--sleeping under the stars with the Bedouins, with camels tethered right above us, with the babies and so forth; rode camels.

Desert Explorations and Other Expeditions

Nichols: And then as you'll read in this, Dr. Barger, Tom Barger, the president, told him about some ancient fortress that was out there, a small one. Then we went out and started looking for some big ones, and we found ones that nobody had ever documented before, and climbed them. Found wells that went down 180 feet from the top of the jebel, down through the jebel, all the way down to ground water, which was way down there. Nobody knows how old they are; at least we didn't at the time we were there. But clearly, people withdrew to there, because they had a huge entry hole that they would cover with a big capstone. They had the water; and they had enough food, I guess, to be besieged. Or how would you besiege them? They had to have lost all their sheep or whatever else was down below. Nobody knows who lived there. All the Bedouins would tell Roger--they'd say, *waajid 'atiiq*, which means very old. But I'm sure archeologists now know this. They must know; they must have figured out. I have a huge grinding stone in my living room, a great big thing made out of sandstone, which we found on the top of one.

We did a lot of desert exploring. Roger was brave and he liked to do things. He was an adventuresome guy. We drove twice by Land Rover, as a family, from Dhahran across twenty-seven

countries to London and back, which when we did it, had never been done before. We carried tents and had some very exciting experiences doing that. It was a good life; it was an exciting way for the three children to grow up. We sailed in the Mediterranean for three weeks by ourselves during the *melteme*, which is the big storms that go on day and night. The Greeks wouldn't leave port in the morning, but Roger Nichols always had us up and out in force-eight winds, you know! He was an exciting person to live with, because he loved adventure, and we did things that many other people didn't do.

We had a boat for waterskiing; we used to water ski at night with the dolphins beside us, with fluorescence all around us. And we'd have people come way down the Half Moon Bay of the Persian Gulf, to the top of sand dunes; and we'd have lobster picnics. We just did things. For an Iowa farm boy, how he came up with all these--! He had all the ideas and I did most of the execution, which was fine.

Hicke: I think he was fortunate to have you.

Nichols: I often said, "That's the stupidest idea I ever heard of in my life." But I was always wrong. And we did do it. I mean, you know, traveling with three young children from Dhahran in July all the way to London and back. That was tough: you have to carry your own food and water; you worry about sickness; you worry about boredom; you're putting up tents every night in the desert. But it was marvelous. Having grown up in India, this was relatively easy for me to do, once I got over being kind of a placid cow who says, "We can't do it." And he would say, "Yes of course we can do it. You'll love it." And I always did. I'm sure I loved it more than anybody else once I got over that feeling of "Oh, dear! Here we go again!" [laughter]

But he was so interesting. And I felt safe with him; in fact, I would have gone anywhere in the world with that man. He was a good sailor, and we got into some terribly difficult situations back here after 1970, when he used to charter small sailing boats with a crew that had never sailed before, big storms where nobody else was going out. But I knew Roger knew what he was doing. Even though I was seasick and scared spitless, I knew that we were all right, because he was the kind of man you could have followed to the end of the world: he just didn't make mistakes.

I started learning that when we were on the motorcycle the summer of '47, when we went screaming down from Golden in the rain to a meeting in Denver--three-hour trip down--and I sat behind him on this motorcycle. He was going much too fast; and

he just said, "Hang on. And if we skid, think, and throw yourself toward the mountain. Because if you throw yourself one way and I throw myself the other way, we are dead." So we came around a corner, Carole, just as a car skidded on gravel, in the dirt, and right in front of us, went shrieking out into space. We hit the same skid mark, and, you know, I held onto him, and we both threw ourselves towards the mountains, skidded right up--and he was trying to control the motorcycle--right up to the edge of the cliff, which fell straight down 3,000 feet, and here was this car, you know. From that very beginning, I must have realized.

Hicke: You knew what you were getting into!

Nichols: Well, you don't really know; but I had this feeling of overwhelming trust, that this man was so competent and so capable, which is nice. But on the other hand, I also would watch when we were sailing and often said, "Hey!" and he'd look up, and we were heading straight for a huge buoy or for another boat. Because I was so nervous all the time, I was very alert. So again, there was a teamwork there. It was useful, because I was a scaredy cat and he was bold and brave; together we kind of kept going. We had many situations where, without the two of us working together, it would have been the end. That's all--simple as that. [laughter] It was a good combination, in many ways. I was scared; and he was kind of irritated because I was such a scaredy cat.

Hicke: A little caution, as you pointed out, is useful at times.

Tom Barger

Hicke: Let me ask you about Tom Barger, since I can't talk to him.

Nichols: He was absolutely the most marvelous man. I have the *Aramco World* which is devoted entirely to Tom Barger. Now, I presume they left in '68 or '69, and they did a whole *Aramco World* [on him]. You see it in the *Aramco* magazines that come out every month or every two months. You should get a copy of that, because that gives his whole story. He went out there as a geologist. It obviously should be a part [of the history], and it might be a part of the medical--I don't know. He was a fabulous president.

Hicke: I sense that the kind of support and interest in the Saudi Arabian country and culture was part of why *Aramco* did this really unique--

Nichols: The trachoma research--

Hicke: The trachoma, the whole--

Nichols: Oh, absolutely! The real people, Carole, who worked out there, learned to love the Arabs. Tom Barger went out there as a young geologist; he was in the desert all the time; he spoke Arabic well: he really understood the Arabs and he loved them, and they loved and respected him. It is people like that who held Aramco as a strong force out there. There were a few people who came along who were only interested in making money. They would be in charge, but they didn't have the same ability to carry the country with them. Barger was absolutely spectacular. He had a marvelous wife, six children. We just adored Tom Barger. If you don't have it, I will either xerox my copy or loan my copy to you, of his entire life story.

Hicke: I think we can get that.

Nichols: Okay.

Hicke: But it would be helpful if you would tell me which issue it is.

Nichols: I can go back and look it up. I have all of the *Aramco Worlds*. he left in either '68 or '69, so it was one of the issues there. I will go and double check. He was entirely supportive of Roger's trachoma program.

The first time I got out there in '57, there was a big party held honoring Jack Snyder, and I didn't know anything about anybody. I sat at a table on a big lawn with two other people. Right across from me was this awfully nice-looking young man. He was telling about being a geologist and these fabulous stories about the desert and following this one guide who got them out of all sorts of trouble, because he was a Bedouin who knew where they were. Just wonderful stories.

When we got home, Roger said, "Well, did you have interesting people at the table?" And I said, "Oh! There was this one man--." At the end of the conversation at dessert, I had said, "What do you do now?" And he said, "Well, I just sort of sit behind a desk." I said, "Gee, that can't be very interesting. That's not nearly as interesting--" I didn't know! I didn't even really get his name. So I said, "This man was so interesting. He says he sits behind a desk, but it used to be that he was out following this Bedouin and exploring for oil." And he said, "What was his name?" And I said, "Oh, dear. Berger? Buckley? Bucker? Barger? Tom Barger?" And Roger said, "Oh. He's president of Aramco." I said, "You're kidding. No wonder he sits behind a desk!" But Roger said, "Well, at least you didn't butter up to him." I said, "Well, I was just so

stupid I didn't know who he was." [laughter] But he was so modest. Oh, they were a wonderful family.

We went on several, long desert trips with them. He knew the desert very, very well, and had done a lot of exploring long before. Now we were out there discovering ancient cities that had been buried for centuries, one of them called Thaj. I always loved archeology, so we were digging and picking up arrowheads, and bringing in stones, you know, all sorts of things, because I'm an avid rock collector. We were finding marvelous things.

History and Archeology

Hicke: Are the Saudis doing some archeology now?

Nichols: Oh, yes. They have a whole department. They have a marvelous archeology museum in Riyadh, I think. I've not seen it. Have you ever heard of the Nabateans? Petra?

Hicke: Yes.

Nichols: Okay, well Petra was their main city; but in Saudi Arabia, it was Madain Saleh. The Nabateans ruled the trade routes from 300 B.C. to 100 A.D. All of the Queen of Sheba-type spices were coming up there; before the Romans came in and began to travel the Red Sea by ship, all of the huge, long camel caravans carrying all these spices and gold and whatever was coming from India and China were coming right up that coastline. Both Petra and Madain Saleh were stopping places for food and water. They were stocked, they were helping; and they were charging huge taxes and so forth. That's how they were making their living.

Well, when we went to Madain Saleh, the Christmas of 1969-- the Bangers had been there, but I don't know how many other Americans had ever been there. It was just an open ruin with these tombs in this rose-colored mountain. We'd read about it for years. As a family, we drove there Christmas Eve and spent Christmas there. I brought back some basalt, volcanic basalt-- and there're no volcanoes there, so I don't know where they would have been brought from--grinding stones. The village is all gone, but these rose tombs are there and all of this huge jebel. Just gorgeous. But now, you can't get anywhere near it. I don't know whether they've got it fenced off, but it's just too easy for people to come in and take things. They do have an archeology department. They do recognize that they've got some terribly interesting history there. Excellent archeology. So, they're protecting it and they should.

Travels

Hicke: You traveled to other places, I assume, outside of Arabia.

Nichols: Oh, yes. We went to Africa, India. I went to India every year for many, many years. Back and forth through Europe. We never got around to the Far East, partly because we just were so interested in the Middle East. We both liked the Middle East so well. Every year they give you a short vacation, and every two years you got a long vacation. It seems to me the long vacation was--could it have been three months?

Hicke: Yes, I think that's what I've heard from others.

Nichols: You had to leave the country. They handed you the money and said, "You have to leave the country." Because they wanted people to get out and get a fresh view. So we could buy both of the Land Rovers we had. They handed us \$6,000, and we could take one Land Rover up to London; buy a new Land Rover; and bring the relatives back. We didn't use the money for air tickets by and large because we wanted to be out exploring.

I was very lucky, Carole. There were other people out there, but not many as adventuresome, interested, or capable as Roger. We were the first ones, as far as I know, to make that drive. And then other people were doing it.

Hicke: You must have gone through Lebanon and Syria?

Nichols: Oh yes.

Hicke: And Anatolia?

Nichols: Absolutely. In fact, we loved Turkey best of all. We went around the whole edge of Turkey and we went through the center twice. Our oldest daughter Kathy, who's a lawyer, was out there when Roger died in '87. She and her husband were out there; he was an engineer with the Corps of Engineers.

Hicke: Well, I think we've covered most of what I wanted to ask you. This has been a wonderful view of your husband's life and your view of Saudi Arabia and Aramco. Thank you.

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Aramco Medical Department Oral History Project

Dorothy McComb

TRACHOMA PROJECT: 1953-1976

An Interview Conducted by
Carole Hicke
in 1996

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Dorothy E. McComb, 1996.

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INTRODUCTION--Dorothy McComb

Dottie McComb was part of the trachoma project--a joint project involving the Harvard School of Public Health and Aramco's Medical Department. It remains one of the crown jewels of Aramco's health care efforts during the fifties and into the mid-seventies. This was a project which began with clinical observations on eye disease among the inhabitants of the Eastern Province--many of them Aramco's employees and dependents--and moved from the field into the laboratory. And in the laboratory, it could be determined that among the multiple causes of eye infection, it was the trachoma organism which was responsible for the most serious and the most widespread eye disease. Using the new technique of fluorescent staining to identify the trachoma organism in eye scrapings, it was possible to carry out epidemiological surveys at a pace, and with discrimination, heretofore not possible. Ms. McComb played a prominent role in both the field work on trachoma and related studies carried out back at Harvard's School of Public Health. Her technical expertise in the field and in the laboratory made her an invaluable colleague--another true pioneer of Aramco medicine.

Armand P. Gelpi, M.D.

December 9, 1997
Sonoma, California

INTERVIEW HISTORY--Dorothy McComb

In 1953 Dorothy McComb was hired as a researcher by the Harvard School of Public Health, thus beginning an association with the Aramco/Harvard Trachoma Project that lasted nearly twenty years. She was therefore in a position to describe in detail the initiation of the project, the state of scientific knowledge about trachoma at that time, the village surveys undertaken, the search for a vaccine, and the results obtained. She discusses the challenges the teams faced in the Arab villages as well as the difficulties the investigators found in isolation of the microorganism. Experimental vaccination in the early 1960s was followed by samplings in 1972 to check responses. McComb also describes other personnel involved, such as the late Dr. Roger Nichols, who headed the field program, Ali Abdul Rahman, lab technician, Dr. Robert Oertley, Richard Daggy, and other members of the research team.

McComb was interviewed on April 19, 1996, at the Harvard Club in Boston, Massachusetts. She brought along notes from journal that she had kept during the investigation. She revised the draft transcript extensively, to the extent that most of it was completed as her written document. The result is a precise and knowledgeable description of the trachoma research in Saudi Arabia.

Carole Hicke
Project Director

January 1997
Regional Oral History Office
University of California, Berkeley

Regional Oral History Office
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BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

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Organizations in which you are active FIRST CONGREGATIONAL CHURCH, HABITAT FOR HUMANITY

I TRACHOMA RESEARCH PROJECT

[Interview 1: April 19, 1996]##¹

Starting Work with the Project

Hicke: Please tell me how you got started and involved with this trachoma project. That was the major thrust of what you did, right?

McComb: I graduated from Simmons College in 1953 with a bachelor of science degree in biology. In those days the job market was in our favor, lots of jobs. Simmons College is located about three long blocks from Harvard Medical School and the Harvard School of Public Health. I headed for job interviews at both places. At that time, John C. Snyder, M.D. was chairman of the Department of Microbiology at the Harvard School of Public Health.

Dr. Snyder and Edward Murray--both of them physicians, and both of them doing research--had been involved in epidemic typhus outbreaks in Egypt during World War II. After the war they came to the Harvard School of Public Health. I interviewed with and was hired by Robert Shih-man Chang, M.D. Bob was in the process of trying to develop some serologic tests for leptospirosis, a disease that affects both humans and dogs; at that time he was working with leptospira cultures that had been isolated in dogs. He was a wonderful teacher--I mean, how lucky can you be? When you made mistakes--which I don't remember making that many--it was a learning process. He never condemned you for something that you had done. In 1953, the research focus in the department was primarily on rickettsial diseases. That's where Ed Murray's expertise was, as well as Jack Snyder's.

¹This symbol (##) indicates that a tape or a segment of a tape has begun or ended. A guide to the tapes follows the transcripts.

We had a laboratory with access limited to people who were vaccinated. These microorganisms were highly infectious for people who were not immune. The infectious areas were secure behind an iron door, which quite literally was about three inches thick, and we all had keys to get in. That's where the laboratory cubicles were located.

And since I'm telling anecdotal things, we had an episode where a man who wandered in off the street--this was some years later--somehow managed to get up to the second floor of the building, walked across the corridor and then downstairs to the basement of our department. There he encountered a technologist who was working in mycology (fungi). The technologist recognized this man was definitely in a restricted area. She called Ed Murray, who by this time was acting head of the department, because Jack Snyder was already dean of the school as well as still being head of the Department of Microbiology. She sent this man up one flight, then called and told Ed Murray what she'd done. Ed Murray was coming down the corridor from his office, and there was no way this fellow could get by him. So, in a very nice way, he explained to the man that he'd gotten back into an area that was restricted because of the kinds of work we were doing and he promptly took him down to his office and told him that he would have to vaccinate him against epidemic typhus!

Now I have to put a little footnote in here, because this fellow was up to no good (claimed he was looking for personnel). We did have some thefts in the past. Ed Murray couldn't wait to tell us the whole story after he'd gotten through vaccinating this fellow. He said the beads of perspiration just came out all over his brow, and you knew he would walk out that door and tell his buddies to stay away from that building, because this is what they would do to you.

Dr. Snyder Undertakes the Research: Problems of Isolation

McComb: Working in microbiology was really very interesting because you learned about other research than your own. In 1954 Jack Snyder made a trip to Saudi Arabia to do a presentation for the Persian Gulf Medical group; from that evolved the question of looking at doing some research on trachoma in the Kingdom. Saudi Arabia was probably one of the areas in the world where the eye disease was the worst. In 1954 the microorganism had not been isolated. Related microorganisms like lymphogranuloma venereum and psittacosis had all been isolated, but not trachoma.

Hicke: Maybe you should explain isolation, because I read that paper you sent, it's all on isolation, but I don't quite understand what that means.

McComb: A suitable medium is required to culture microorganisms--bacteria or viruses--from infected tissue. In the case of polio virus, isolation was done in monkey kidney cells grown in glass test tubes. The virus killed the cells. When samples were transferred to fresh monkey kidney cells, those cells became infected. That is called isolation. Further work was required to determine how many types of polio there were.

Hicke: It's different from identifying?

McComb: Oh yes. The identification is a separate process. Now you have to know what you're looking for before you choose the type of medium you're going to use. In hospital laboratories they will have solid media on petri plates, and they can take a little wire and touch the inside of your mouth and swish it around, and they will probably get ten or fifteen different kinds of bacterial colonies that will grow on that particular medium. For viruses, it is sometimes more difficult. The microorganism causing trachoma was called a virus initially; it is not. However, since trachoma infects the human conjunctiva, Bob Chang established a culture of conjunctiva cells from humans to attempt the isolation of the trachoma microorganism.

Hicke: Isolation then means actually being able to grow this, not just identifying it, but being able to get it to reproduce.

McComb: Yes. They knew what it looked like, interestingly enough. By taking a scraping from an infected conjunctiva, smearing it on a glass slide, and staining it with giemsa stain (common laboratory stain), the inclusions inside of the cells could be seen.

Hicke: But they couldn't figure out what was causing it to grow?

McComb: They didn't know how to isolate it. In the populations where the disease was the worst, other microorganisms in the eye contaminated the culture medium used to attempt isolations.

In the summer of 1955, Bob Chang, the one who developed a human conjunctival strain of cells, took these cells to Saudi Arabia to attempt isolation of trachoma. The paradox is it worked and it didn't work! No isolations of trachoma were made. But...the first isolations of coxsackie viruses and adenoviruses were made and identified.

In 1957, Dr. Tang, who was working in Peking, China, did something for which all of us thanked him. He simply took streptomycin and mixed it with the sample taken from a patient with active trachoma. Giving the streptomycin time to eliminate bacterial contaminants he then inoculated that mixture into the yolk sac of an embryonated egg. His work was published in the *Chinese Medical Journal* in 1957. In very early May of 1958 our laboratory learned what he had done. It was just like an eruption for all of the laboratories who had been working unsuccessfully in this area. Now we had a means to begin the process of learning something about this microorganism. But, I'm ahead of the story.

Hicke: Right, we're still in '54 or maybe even '53.

Relationship Between Harvard and Aramco

[Following sections were mostly written during narrator's review]

Hicke: Can you explain exactly the connection between the Harvard School of Public Health and Aramco? As you said, it started with Dr. Snyder, he was by this time dean of the Harvard School of Public Health as well as head of the Department of Microbiology. He went out to give a lecture in Dhahran to Aramco executives and physicians from the region.

McComb: Aramco (Arabian American Oil Company) had recently completed a new hospital. In the construction of the Dhahran Health Center the company obviously were thinking in terms of some research. That's why they included research laboratory space on the second floor. The Persian Gulf Medical Group, some of whom had been to Harvard for scientific meetings, were not unknown to Jack Snyder. I think the person originally to have gone to make the presentation was Dr. Simmons. He was dean of the school at that time. Dr. Simmons died suddenly, and Jack was asked to be the pinch hitter. In addition, Jack Snyder was unaware of what kind of presentation Simmons was going to make. He sort of had to go out there almost cold turkey. But while he was out there, I believe the question came up as to initiating a research program of some kind. I also think Snyder felt that the research definitely had to be something that dealt with the local population.

It was Dr. Snyder's suggestion to Aramco to support research on the eye disease trachoma. Approximately 400 million people in underdeveloped countries around the world were infected with the eye disease trachoma (*Chlamydia trachomatis*), many showing signs of serious sequelae. After his visit to Saudi Arabia and Aramco

in 1954, a joint program was announced to begin research to isolate the causative microorganism, the program to be funded by Aramco and the principal investigators to come from the School of Public Health.

In the summer of 1955 a team from the Department of Microbiology at the Harvard School of Public Health left for Dhahran, Saudi Arabia, headquarters of the Arabian American Oil Company. In the group were: John C. Snyder, M.D., Edward S. Murray, M.D., Robert Shih-man Chang, M.D., and Samuel D. Bell, Jr., M.D. They were joined by Mario Tarizzo, M.D., an Aramco employee.

All of the equipment, solutions, and materials needed for the initial study were brought from Boston. In addition, Bob Chang's wife, Yinette, joined the group, as she had particular expertise in cell culture. In anticipation of this trip, Bob Chang had developed a line of normal human conjunctival cells which were to be tried for the isolation from the eyes of Saudis with the disease.

Yinette had the task of setting up the laboratory in the new space on the second floor of Aramco Health Center. The facilities included the "kitchen," a room for washing glassware, an autoclave for sterilizing glassware, equipment and media, and a small storeroom for supplies. Immediately adjacent off a central corridor were the lab areas consisting of five rooms with benches, drawers, cabinets, hoods for cell culture and a large -60°F Revco freezer for storage of clinical specimens.

So in 1955, Jack Snyder, Sam Bell, Bob Chang, and Ed Murray went out to Saudi Arabia to do an initial survey of trachoma in the villages. It was not going to be a big survey, but they needed to get a look at the people in a few villages in different parts of the Eastern Province of Saudi Arabia. The laboratory was located in the Aramco Health Center in Dhahran. It was a fairly well-planned laboratory, in terms of space, and newly built.

They obviously needed a medium in which to collect the samples. For years Snyder and his colleagues worked with the rickettsial microorganisms, including Rocky Mountain spotted fever. The medium of choice was a solution which had phosphate and glucose in it. They just had to assume this might also work for attempting the isolations of trachoma. Using tiny vials containing the solution, they would take a little scraping from the child's conjunctiva and twist it in the solution. A sequential number would be assigned and each vial placed in a portable icebox. Samples returned to the laboratory would be frozen under dry ice and alcohol (approximately -60°F) and then

stored in a -60°F freezer. To protect the samples they would be brought back to Boston under dry ice for testing.

While in Saudi Arabia Bob Chang was also trying out his cell line of conjunctival cells in attempts to isolate trachoma. While this approach failed, isolation of two groups of viral agents were successful--adenoviruses and coxsackie virus. The laboratory results showed the potential for many infections of the eye in the Saudi population. These early results came to bear on a growing understanding of the disease process in the eyes of children--i.e. isolations of infectious agents, the clinical appearance of the eye, and epidemiologic factors. Trachoma in the Eastern Province of Saudi Arabia was severe, with vision impairment early in life.

Village Surveys

McComb: At the end of our twenty years of work in Saudi Arabia, in the village of al-Mallahah, we did a survey of all the people from the youngest to the oldest. Twenty percent were blind in one or both eyes.

Hicke: How many would the total be that you surveyed?

McComb: About 500. Now we're talking economically blind, in other words they might be able to see shadows, but for the purposes of the study they were blind.

I probably should mention at this point that when we got further into our vaccine studies, we were looking at three different types of villages and settlements. The village al-Mallahah was very small, but it was a community in and of itself. It was right next door to another village, yet there was not much intermarrying. The young girls married very early, anywhere from eleven, twelve, thirteen, fourteen years of age. Sometimes that was done with the stipulation that they not have intercourse until they got to be fourteen. This was something parents worked out.

Al-Mallahah and others were considered the primitive villages. No running water, and only a central latrine. To be sure, they boiled water that they used to cook with or to make tea, and they did very well trying to keep the children from having flies. But the flies were everywhere, on the eyelids of the kids; and the kids got so used to it they didn't pay any attention.

Hicke: Was the water brackish too?

McComb: No, the water was pretty good; they had some deep wells. When the mothers would see the children with discharge from their eyes they would just wipe the eyes with their abba or outer garment. So the transfer almost certainly was done a lot by just clothing, from one child to another. Then once the eyes had been infected, the condition of the eyes got worse and then would subside. Cycles of active disease occurred periodically.

Hicke: You mean an individual would go through cycles?

McComb: Yes, you'll see. I'll show you some examples later of how the disease was scored; there was scarring of the conjunctiva, infiltration of the cornea--i.e. observation of blood vessels penetrating the corneal area. For those who had experienced this over a period of thirty years, many of them had a clouded cornea, and often they would be totally blind in that eye. It was a disease process that was set in motion early in life. When analysis of the data began we found that most of the children were infected by the time they were three months old.

We finally categorized the Saudi villages into three types based on the types of living conditions. So you have what I would call the primitive village, such as Al-Mallahah. Then, on the other extreme, what Aramco called its "town sites." Aramco was already ahead of the public health game, because they realized that many of their Saudi employees were coming from these kinds of primitive villages in the Eastern Province. What the company chose to do was to give their employees the opportunity to live in a brand new home, which they would build at new sites. But they didn't want to build them to the old-style communities. They wanted to build it in a new area. There were two of these "town sites" where we examined children for trachoma: one was in Ras Tanura, which was fifty miles north of Dhahran (the location of our laboratory), and the second in Abqaiq, fifty miles south of Dhahran. These "town sites" were all new housing with running water and toilets.

The third type of housing was a mixture of old and new. Qatif, which was a large city by Saudi standards, was located right on the Persian Gulf, or as the Saudis preferred to call it, the Arabian Gulf. If a family wished to build a new house in one of those places, the company would agree to it, and I'm sure there were some stipulations on the site.

Hicke: Do you mean a non-Aramco Arab?

McComb: No, sorry, it would be an Aramco employee who chose to stay where the rest of his family was, i.e. other relatives, rather than

building a house a distance away. So if we jump ahead of the story to describe the actual effects of the vaccine program, which we eventually initiated there and did a ten-year follow-up, you could tell easily which children had grown up in a town-site home. The children appeared to be taller, their health was better, the disease was milder, and the sequelae less serious.

Hicke: That could have been only one generation at most.

McComb: Correct, but they had a safe source of water inside the house, and the clothes could be washed more often. It's the same population of people, but suddenly they're living in very different circumstances.

Collecting Samples

McComb: Getting back to the beginning of the story then: when Bob Chang knew that he'd isolated viruses we were able to type them. The adenoviruses were very new, they'd only been described very recently in the scientific literature. In fact it was apparently a very common infection in the U.S. military, when young recruits came in for training. Proximity of beds in barracks contributed to the spread of the adenovirus as a respiratory infection. They were just beginning to identify them by type (over twenty types of adenovirus have been identified). Some types are more prevalent and more severe than others, so there's an importance in typing the virus once isolated. Most of the strains being isolated in the U.S. military were types 3, 4, and 7. Isolations of adenovirus were an unexpected outcome of attempts to isolate trachoma. However, it graphically showed the spectrum of eye disease in the Saudi population.

Hicke: That did not cause blindness?

McComb: No, not as far as we know. Certainly not in this population. It made you think a bit, because the very technique you hope to use to isolate the trachoma microorganism (in cell culture) obviously didn't work. At that point we had to backtrack. By the time the *Chinese Medical Journal* article was published in 1957 detailing the first isolation of the trachoma agent, our laboratory probably had 500 samples frozen down in a Revco freezer in Boston.

Hicke: When was this survey that you told me about?

McComb: The first team went out in the summer of 1955. They collected samples and brought them all back to Boston.

Hicke: Is this the same survey as the one you told me about in the small towns?

McComb: No, that came later, that's actually several years later. We needed to know a lot more before then. With the information from the *Chinese Medical Journal*, we literally walked across the hall of our Boston laboratory, took these 1955 specimens out of the freezer, did just what the Chinese did, and isolated the trachoma organism from five children. The method the Chinese used was the treatment of the patient's sample with streptomycin, followed by the inoculation of the mixture into the yolk sac of embryonated eggs. The use of streptomycin largely controlled the death of the embryos from bacterial contaminants. The technique is as follows: candle the eggs to check for a live embryo. When the embryo is about seven days old, a tincture of iodine is used to sterilize the top of the egg. Then using a syringe and needle, the sample is inoculated into the yolk sac. The top of the egg is sealed with a mix of paraffin and beeswax. The eggs are placed in a 37°C incubator. Eggs are candled beginning on the fourth day. If the embryo is dead then you just discard the egg. All others are candled daily thereafter.

Hicke: The ones that live.

McComb: Yes. What happens is the infection from the trachoma organism will eventually kill the egg. When that happens you remove the yolk sac membrane in a sterile fashion and homogenize it in a glass vial containing a special solution. We used to do that with glass beads to break apart the yolk sac membrane. We might only inoculate two or three eggs for each sample from one person. Confirmation of the presence of tiny spherical elementary bodies was done by staining their smears on a glass slide of the harvested yolk sac, which was then examined with a microscope under high power magnification.

This was the first part of the process, but it worked very well in terms of being able now to isolate and to grow the microorganism. It also meant that we could then grow it in large volumes, if we wanted to. There was much work put in initially on just getting information on the growth of the organism. Obviously the intent was to hopefully make a vaccine at some point, to protect people against the infection to begin with. So I'm going to jump ahead a bit, because you need to know that the vaccine didn't work.

Hicke: Okay, here's the end of the story already.

Learning about Arab Culture and Undertaking Village Visits

McComb: But there was a long period in between, a long period in between. Part of it was getting to know a lot about the Arab culture and what worked best, and we had very good help from Aramco in terms of support. We had three male Saudi nurses who worked with our group. This is on the vaccine part of the program. We had bilingual clerks who were loaned to us because we needed to keep our records accurate. When we went back to see a family, we wanted to make sure that that was in fact the family that we saw two months before, or two weeks before. We always took a bilingual interpreter (English/Arabic) with us on village visits. He was critical, because we needed to get accurate family information to avoid the similarity of names between families in one village. These individual records were large (18"x15" on linen paper for durability), preprinted on two sides for multiple categories of data to be collected.

That was one reason that I initiated a log book the very first time we started out on the vaccine program, because there were many important events that could not be recorded on the individual patient record. If something happened in the course of the day's outing that we needed to know or that might affect our results, the log book was the place to record the information.

Hicke: Can you give me an example?

McComb: Sure. We went down to Abqaiq, one of the Aramco town-site villages fifty miles south of Dhahran. We assigned each child a distinct IBM number. There were blocks of numbers for each village to avoid any mixings. Everybody knew we were coming. By announcing we were coming back for a visit, the children and parents would be lined up waiting for us when we arrived.

Hicke: They didn't object to this?

McComb: Oh no, they were really very good. Very, very good. In fact when we went back for a ten-year follow-up, there were women who brought with them the IBM numbered tag that we had assigned to that child on the first day. It was a linen tag which we tied around the wrist of the child. It had the IBM number stamped on it for easy reading. If the family showed up with the numbered tag we would still ask them all of the family information to make certain we had the right child. Most often we were working outside of any building; in the primitive villages, there was no place big enough for us to work inside.



Umm Al Khamam--Qatif Oasis Boys School, Saudi Arabia, January 8, 1969. Left to right: Dorothy McComb, Dr. Arthur Bobb (ophthalmologist), Mrs. Joan MacIntosh, Mrs. Nuha Hejazi, Dr. Roger Nichols, Karen von Fritzinger, Kathy Burns, Dorothy Longfellow, school principal, Ali A. Rahman, S. Saud, Betty Honing.

Photograph courtesy Saudi Aramco Archives

In Abqaiq Town-site we were working inside the health center. A woman came through the line with a child. She didn't have the child's record in hand. We went through the stack of patient records kept in IBM number order. The clerk who was checking the patients in would pull the sheet out and that would go with the patient through the examining stations. After a thorough search we still couldn't find the record. We'd never lost a record before, and there was some consternation in our group! We decided that what we would do was to inoculate the child with a placebo--we always carried sterile saline with us--because we couldn't take the time to figure it out and we didn't understand it. Much to our surprise when the child's garment was raised there was the patch of iodine indicating the child had been vaccinated! Turns out, they'd already been through the line. Somehow the mother had gotten confused and thought there was more to it and got back in line. The IBM sheet for the child was already in the "out pile"!

Hicke: Oh dear. It's a good thing you used a placebo.

McComb: The placebo did not need to be given. The mother and all of our team got a good laugh. But it just shows you the stress of it, you know, because there would be a lot of people who would stand in line for a long time, and we'd just take them in the order in which they came.

Hicke: I suppose that's one of the things you had to look out for then.

McComb: The village women had tasks to do. We were working in Anik, which is an interesting village. It was different in that it was primarily a Bedouin village. The men and the flocks of sheep would be out grazing in the springtime. There would be some people in the village, mostly women and children. We'd gone to that village one day with much to do. Partway through the process you could tell that the women were getting tired of standing. I didn't know enough Arabic then but we had translators with us and--my answer to most problems is humor. One of our translators was telling me how the women were getting tired, because they were holding the children, the youngest ones that they were bringing. Then I said okay, so you tell her I'm going to take the baby. I just dropped what I was doing and I walked over and I took the baby and said I'd take it home with me if she didn't want it. Much hilarity! They're wonderful people. They all just chattered and laughed. It was necessary to release the tension somehow, because otherwise we were not going to get through the day. I really meant that, the people in the village were just wonderful, they were easy to work with, they just didn't have many problems. Except one time in 1972 when we were going back to look at some of

our vaccines in the village of Al-Mallahah. Only this time the physician Bob Oertley was the person on site.

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McComb: It was getting late, and by that I mean dusk. We were working with a darkened van that had a slit lamp in it for examination of the eyes. The routine was that you checked the people in, you did the preliminary exams of the eye, and then the child went into the van and had a slit lamp exam which provides a very precise measurement of the clinical status. Henry Allen, MD., an ophthalmologist with the Massachusetts Eye and Ear Infirmary, came to Saudi Arabia to do the exam with us the whole month of November. While the work is strenuous, it also must be precise. In the waning light the teenage boys, probably around age eleven or twelve were just trying to figure out how they could steal the sponges off our working table, running around and creating havoc. Here we were trying to finish up and probably didn't have more than fifteen or twenty minutes of work left, but we needed light to be able to see, and it was just getting too dark. So finally, Bob Oertley and I had cleared the last of the people through the early stations, but they still had to go through the rest of the slit exam.

I said, "Bob, we've got to do something." Now this is a village where there was nothing but dirt roads and gullies on the side of the road. I said, "I'll tell you what; let's go across the road over there. We'll get away from the group that's still trying to work here. I think we ought to teach these people how to sing "Three Blind Mice." Now that may sound funny to you, but as soon as Bob and I moved over there, just like the Pied Piper, all of these big kids followed us. And so we started; we taught them the first verse of "Three Blind Mice." They knew some words of English, but they didn't know English very well. They picked up this song quickly after we taught them and went through it a few times. Then we sang it as a round. By this time we were joined by a couple more of our staff so we had somebody to lead each of the three rounds. Every visit thereafter to that village, they wanted us to sing "Three Blind Mice!"

Hicke: I bet they couldn't make any sense out of the words--nobody can anyway.

McComb: No, but I bet they probably could get somebody to tell them. They knew what mice were; they could probably get somebody to tell them what the full story was.

In that phase of the trachoma program we were revisiting several villages. With us was a female Saudi physician who was

studying medicine in Aberdeen, Scotland. Each student is required to do what is called a clerkship. Her name was Tahiya bin Hemd.

Hicke: What year are we in now?

McComb: This is the fall of 1972. Tahiya wanted to come back to Arabia to do her clerkship. Somehow she'd heard about our group and written to Bob Oertley. His response was "by all means." And so she was there that November while we were doing all these follow-up studies. She had been blinded in one eye from measles when she was a child. She'd been fitted for a glass eye, but at the time she still had the eye covered with an eye patch. The women in the village are of course veiled. It's really more a veil that they pull over their face rather than a face mask. The Bedouins are the ones that wear the face masks with the eye slits.

Tahiya worked with me as we got the records in the lab ready to go out to the villages on the follow-up to the vaccinations. She didn't veil. Nobody said boo to her about that, certainly not any of us. But I wondered what's going to happen when she goes out to the village with us. Well, she didn't veil, and those kids and those women all knew that she was a Saudi. The interesting thing is that they absolutely accepted her. So there were barriers being broken in this period, and it was during that time I witnessed young Saudi women who were university educated who were working for the oil company Aramco. The women were picked up by company automobile. They wore a veil while they were going from their home in the Aramco compound to the hospital, but then would work in areas where they would not be in the presence of male Saudis. One of these young women was a petroleum engineer! And of course there are many young Saudi women working now; some of the barriers for women are pretty much down.

Hicke: The women never worked with the men in Aramco, is that what you're saying?

McComb: Well, I think they do now.

Hicke: But at that time--you're talking about the '70s.

McComb: Yes. Most of the older Saudi men in the communities of course would frown upon it; but we also found that taking Polaroid pictures under some conditions was possible. We thought of doing that as a way of identifying our patients. But actually there was a prohibition of photographing the Arabs. I think it was pretty much respected. Once we'd gotten to know the people in the villages limited photography was possible. For instance, if we were in somebody's house and they knew we had a Polaroid camera, they didn't mind us taking pictures of their family; they just

didn't want their neighbors to know. But if you'd gone separately to the neighbors, they would have agreed as well.

Hicke: But as a matter of policy you couldn't do it in an official way.

McComb: Correct.

Successful Isolations, then Vaccination

McComb: So, if we go back to the beginning of the story then, once that initial survey was done in Saudi Arabia they had a pretty good idea of: A) how bad the disease was, and B) what we were up against in attempting to isolate the microorganism causing the disease trachoma. That barrier was crossed when the Chinese published their data; and from that moment on, we actually just rolled right through all of those frozen samples stored in Boston. Clinical samples from the conjunctiva were inoculated into the yolk sac membrane of embryonated eggs. Once the organism was isolated it was noted on the record for the patient. It was assigned a number. The designation SA was used for Saudi Arabia and a sequential number added to indicate the sequence of isolations from individuals. So, SA-5 was the fifth isolation made.

Hicke: Now what did this mean?

McComb: When you see this microorganism inside a cell, it's called an inclusion as it's more or less encapsulated. Inside that capsule are just hundreds of these tiny little spherical bodies. When the cell ruptures, which it does, these elementary bodies, as they are called, go looking for more cells to infect. Large amounts of infected yolk sac membranes could be prepared from sequential passages in embryonated eggs.

What we had to do eventually was to have to develop all of the reagents that we needed to do our own work. Now you can go out and buy some of these from pharmaceutical companies, but at that time we had to make our own. You took a sample of a person's conjunctiva and smeared it on a glass slide and then stained it with an immuno-fluorescent stain, i.e. antibody to the trachoma microorganism which is tagged with fluorescein. The tagged antibody would then latch onto the organism inside the cell. By looking at the slide under a dark field microscope, if there are trachoma inclusions present in the conjunctival cells, they will fluoresce.

And so that's what we laboriously did for all of these kids who had been vaccinated with an experimental vaccine. We had the conjunctival scraping we took before they were vaccinated, and several times afterward. To simplify the task each conjunctival scraping smeared on a glass slide was circled with a glass marking pencil that had a sharp point on it. After exposure to an immunofluorescent stain, the cells were scanned under the microscope. The number of inclusions were counted and estimate of the number of conjunctival cells made. This was the only crude quantitative way to estimate the level of the microbiologic infection.

Hicke: I think I missed something; first you surveyed them and took samples, but when and with what did you vaccinate them?

McComb: A large amount of the microorganism was grown in our Boston laboratory using the yolk sac of embryonated eggs. This was partially purified. Two types of vaccines were prepared, one a fluid vaccine and one containing an adjuvant. The adjuvant is supposed to enhance the effect of the vaccine.

Hicke: So then you went back and vaccinated them, then you took samples again to see if the vaccine was okay?

McComb: Yes. Parke-Davis Pharmaceutical company took our vaccine preparation, added the adjuvant and packed it into syringes all ready to use. That process was done outside our laboratory. The vaccinations in Saudi Arabia took a pretty good-sized team; there were around ten of us who were involved on any given excursion to a village. Each type of vaccine had a placebo control, so the adjuvant was labeled A and B. Nobody knew whether A was the vaccine and B was the placebo or vice versa, and on the fluid vaccine, same thing. Each vaccine code was marked in the patient record.

Hicke: Did you do half and half, or how was that?

McComb: I don't now remember how the team physicians decided.

Hicke: And then how long does it take for you to study the results? First of all, when did you go back and vaccinate?

McComb: I think it had to have been some time in the early sixties, I could probably tell that from the records.

Hicke: That's your log? You still have it?

McComb: It was April 1962.

Ten-Year Follow-up Visits

Hicke: And then, when did you go back to take more samples?

McComb: We did a ten-year follow-up in 1972. That's when Tahiya, the Saudi medical student, was with us. We added one more component to it, to do an eye vision test. And I'll show you the thing that we used; it was something that Henry Allen, M.D. had developed for use in countries where literacy and language was a problem.

Henry Allen was an ophthalmologist and the kind of person who donated his time; he made these kind of trips to South America. Great guy. He was Chief of Ophthalmology at the Massachusetts Eye and Ear Infirmary. The MEEI is physically attached to the Massachusetts General Hospital in Boston but they are two separate institutions. How he would charm the kids. He was bald, really bald! I think he must have shaved it. He taught the kids about doing mumbletypeg, you know, where you tip an open jackknife so it goes blade first into the ground. He also created a mouse out of cloth and he would make it crawl right up his arm! You knew very well he had worked a lot with kids. Sometimes you just need to get the attention of kids, and to do that a gimmick helps. He was a wonderful person. He did all of the eye examinations for the ten-year follow-up.

We were there for a month in November of 1972. I'd gone out a little bit early to get things organized. When the field work was completed, he and I flew out together to Boston. The work was very intense as we were working outdoors in the villages almost everyday. You don't think about it; but you love what you're doing, it's so very important.

Hicke: Well, that's good. That's the way it should be; but it doesn't always turn out that way.

McComb: One of the problems we faced was taking blood samples to test for antibody titers to trachoma by taking finger pricks.

Hicke: Finger pricks?

McComb: Yes, using tiny capillary tubes. The blood was expelled into a small pointed plastic tube containing a diluent. Once the red cells settled out of the supernatant, the serum could be tested for antibody to trachoma. The other thing that we wanted to look at was whether there was antibody in the eye secretions. Initially in the field work in Saudi Arabia the eye secretions were collected. With a small strip of filter paper placed in a sterile glass vial and eluted with a small volume of buffered

saline. Later in the course of research on owl monkeys small sponges were used.

Hicke: What would be the significance of that?

McComb: To learn whether the disease has actually prompted a local response from the immune system.

To obtain the eye secretions, you pulled the lower lid down just a little bit and put the end of the filter strip in. The strip would fill up immediately. Then the strip containing a measured amount of fluid was put into a glass vial. In the vial we combined the two strips, one from each eye. To detect antibody to trachoma, serial dilutions of the eye secretion were exposed to both yolk sac infected with trachoma and normal yolk sac side by side on a glass slide. If antibody is present, the antibody sticks to the microorganism on the slide. Rinsing the slide and layering with anti-globulin containing fluorescein the result can be read under a fluorescent microscope. In retrospect it was a very tedious process in order to get a yes or no answer as to whether antibody was present locally in the eye. There was!

Today the disease (the microorganism) is called *Chlamydia trachomatis*. In this country, it's a sexually transmitted disease, often causing pneumonia in newborns whose mothers are infected. In Saudi Arabia the transmission is eye to eye.

Hicke: You're now talking about the work you did at Harvard, right?

McComb: Yes, much of the early work was done in Saudi Arabia between 1955 and 1972. Remaining activities in the Saudi Arabia laboratory were not concluded until 1976 when I went out to close it up. One of our unusual tasks in Saudi Arabia was to make our own dry ice. By taking CO₂ (carbon dioxide) and compressing it, the solid dry ice mixed with alcohol could be used to freeze samples for storage at minus sixty degrees.

Hicke: So for some of these processes you had to innovate, because you were in Saudi Arabia and they didn't have them; but also there were some things you had to innovate at Harvard because they hadn't been invented?

McComb: Absolutely.

Hicke: Can you give me some other examples that I might be able to understand?

McComb: Well, I'm trying to think. In our isolation method, we eventually got it to grow the trachoma organism in cell culture, but it was

with great difficulty. We had to centrifuge the material onto the cells. But as far as getting us from the patient with the disease through the process to test an experimental vaccine this really took time. It was a fair amount of work from 1955 until the spring of 1962, when vaccinations were begun. We needed to know a lot of things. We needed to know how many different serotypes of microorganism there were in order to know what to include in a vaccine. Two serotypes 1 and 2 were combined for vaccination. Those decisions had to be made by the physicians who were in charge of the program. When it became clear from the follow-up studies in the Saudi children that the vaccine really had not been effective, then we were at the point with, well what do you do next? What you really do is what Aramco had already started to do, i.e. change the environment and personal habits. When I went back to the Saudi study village of Al-Mallahah in 1976, and closed the laboratory, the narrow streets had already been paved.

Hicke: Oh, this little town. [looking at photo]

McComb: It's hard to move people from a village that they've lived in for generations so they can experience a cleaner environment for the health of themselves and their children. But the Saudi government was already building brand new schools all over the Eastern Province, first for boys, then for girls. Times were changing. When I left Harvard in 1977 I went to work for an organization that was helping the governments in the Persian Gulf area to do much needed health planning, both of services and facilities.

Hicke: What was the name of that organization?

McComb: A non-profit organization; University Associates for International Health. It was made up of faculty from AUB (American University in Beirut), Harvard, and Johns Hopkins. It was great because I had a lot of experience in the Middle East and they needed help in health planning. Many of the plans that were recommended are now in place.

Hicke: And as part of this group you did follow up on trachoma? You went back in 1976.

McComb: No, the program ended in Saudi Arabia in 1976 when I went out to close the laboratory.

Vaccines and Cures

Hicke: Let me ask you a couple of basic questions. You were looking for a vaccine. Is there such a thing as a cure? You weren't looking for a cure?

McComb: Antibiotics can be used, but the difficulty is treating that kind of massive disease with an antibiotic, since reinfection was common. It's not as though you treat once and that's it.

It's like smallpox; everybody knew that the way to eradicate smallpox was: A) to vaccinate, and B) to find the last cases and isolate them. And that took years. There were people at the School of Public Health at Harvard who were involved in the smallpox eradication program through the World Health Organization. One of the biggest problems in India was getting Indira Gandhi to give permission to track cases of smallpox. With cooperation from government, tracking active cases was easier because the evidence showed clearly on the skin. The last case was tracked down in Africa. Finally smallpox had been eradicated, and the scientific community has been debating getting rid of what stocks of vaccine and live virus are frozen away in laboratories, lest somebody do something dreadful and start epidemics all over again.

Hicke: Dr. Taylor was telling me that he wasn't convinced that there isn't still some smallpox around; he saw some cases of it when he was in Saudi Arabia.

McComb: I saw a case my first trip out there, in 1956.

Hicke: He said they got it very young, too.

McComb: Yes, this child was about eleven. He was dead. Smallpox is unique in that it is only passed through humans; as far as they know it does not have any animal reservoir. So therefore, if you've been exposed to it, you will get it. The epidemiologists really tracked down all of these cases. It was amazing.

Hicke: Let me go back to--

McComb: Arabia, yes.

Aramco was hiring locally from the Eastern Province of Arabia. They had a large Saudi employee group. All employees had access to all of the health care services that Aramco was providing. Part of the support from Aramco was to provide one of their Saudi employees to man the "kitchen." That was how Ali

Abdul Rahman came to be "Our Man Friday." What a perfect choice he was, with a wonderful sense of humor. He remained with the program until its closure in 1976.

Ali Abdul Rahman, now our chief cook and bottle washer, was trained by Bob Chang's wife, Yinette. She was working for John Enders at the time at Children's Hospital in Boston. He was a physician and scientist who contributed to the development of the polio vaccine. With Dr. Enders's concurrence, Yinette went out to Saudi Arabia with her husband that summer of 1955. It was she who trained Ali in the laboratory to wash glassware and to sterilize media and equipment.

Hicke: As a technician, more or less?

McComb: Yes, he was wonderful. He was about seventeen years old at the time. Aramco had taught him English, reading and writing in Arabic, and math. When Aramco went into this training program, they did a really good job for their Saudi employees. Ali was quite fluent in English, and he was one of these very happy souls who would do anything. He dearly wanted to learn to drive an automobile and would press Roger Nichols from time to time to take the company car. Roger sort of kept putting him off. Finally Roger and Elinor, his wife, went on long leave for three months. However, I was still working in the lab in the Dhahran Health Center. But with the kind of work I was doing, I wouldn't need Ali full time. So Roger gave permission for Ali to go and learn how to drive. It was maybe two or three months after that, after Roger had been back, and we were getting ready to go out on a field trip that he told Ali to take the car up to the company garage and get the oil checked.

He hadn't been driving by himself for very long and he must have been a little nervous. However, the company had their maintenance garages right within the compound, so he took the car up to the light car garage. Well, he somehow missed the area where the car was to be driven over a pit. Instead he hit a fire hydrant! Guess where all the water went. The people who were working down in the pits all came piling out.

Hicke: They got a nice cool shower. [laughter]

McComb: While the workers got that situation handled, Ali ran all the way down from the light car garage to the hospital to tell Roger. He was beside himself. He thought something dreadful was going to happen to him. Short of a mild reprimand, it was a good experience for him.

Hicke: A learning experience.

McComb: He eventually did drive the car sometimes out to the villages, but he never forgot the first time he drove alone.

Aramco was well run and the environment was such that you had all the support services you needed. That included special things that we might need from the company to support the research and field work.

##

Dr. Roger Nichols

Hicke: Where did Dr. Nichols fit in?

McComb: That's another interesting story. When we first began work in Arabia, Aramco already had an Italian physician, Mario Tarizzo, who was working with the company. I guess he had some research experience. However, I believe it became very apparent to Dr. Snyder that here Tarizzo was not going to be suitable. Dr. Snyder was looking for someone with more research experience to head up the program and be based in Saudi Arabia. I suspect he talked to many people in the Boston area who might know of such a person. It turns out Roger Nichols was at that time in Saudi Arabia. He'd been assigned to the Health Center in Abqaiq. Aramco had health centers both in Ras Tanura, fifty miles north of Dhahran, and in Abqaiq, fifty miles south of Dhahran. Elinor and the children were still in the U.S., because at that time you couldn't bring your family with you right away. Roger went out to Abqaiq as an internist. However, he'd had significant experience in Boston at Boston City Hospital. So he was well known.

I returned to Boston from Arabia in September 1956. Then Sam Bell and I went back out in February of 1957 with the initial purpose to interview Roger Nichols. Aramco had a couple of types of facilities for visitors. My first year I lived in Steinecke Hall, a large guest house, where the staff were all Indians from Goa. I was the only woman there, so I got lots of attention. Many of the men staying in Steinecke were only engineers on assignment to Aramco from the Hague, Netherlands. My third year out I actually lived in what they called a boracity, which was a square house with four bedrooms and a communal living room and kitchen. That second year in 1957 Sam Bell and I both stayed in Steinecke Hall.

Roger came up from Abqaiq and we met with him. I didn't read the communication that went to Boston but obviously it was

"You better hire this guy." He was exceptional both in his focus as a physician and somebody who was interested in research. And so that first year, he spent only half time with our program. The other half he was head of the pathology laboratories in the Dhahran Health Center, which were on the same floor as the Trachoma Research Laboratory. I forget when he became full-time on the trachoma project, but it wasn't too long after that.

Hicke: What was his actual job with the trachoma project?

McComb: With Aramco he was head of the Trachoma Research field program. Much of that involved discussions with him back in Boston. In the early stages of the research his contribution to the planning was essential. Communication between Arabia and Boston was done by large, flat, transcription tape belts, which could be mailed in large envelopes by Aramco courier planes to New York and thence to Boston. The tapes were then transcribed in Boston.

Hicke: Telex or something?

McComb: No, no--the tape was big enough that you could get a half hour or an hour of dictation on it.

Hicke: And then you mailed the tape?

McComb: Yes, we would mail the tape back, and the secretaries in Boston would transcribe it. Then we would get a copy. You don't think about things like that; in Arabia we were using photocopy equipment that was made in Japan, with paper that dehydrated in four to five years. Then it just eventually crumbled.

Hicke: I remember that. Very early time.

McComb: With communications you had to do the best you could outside of picking up the phone and calling Boston.

Hicke: Which you probably couldn't do either until later.

McComb: Well, we could have, but the point was to keep them informed of what was going on and vice versa. So we shared information on a frequent and regular basis.

Dhahran, Saudi Arabia was a great place to be. I had the opportunity to take evening classes in Arabic sponsored by the company. Aramco of course had many recreational facilities. That included a movie theater, bowling alleys, tennis courts, and baseball diamonds. Most of us who were on the research team loved to explore the desert, and Land Rovers were the way to go. There were many opportunities to get out and see places. Aramco

required you to sign out at the main gate, and you had to sign in on return when traveling outside the company areas in the desert. The reason was in the event anybody got lost. You were required to state where you were going, what direction, and expected time of return. In the event they had to send out airplanes to look for you, they wanted to know in which direction to search. There was wonderful swimming--the Arabian Gulf was close by with warm water --and water skiing was popular.

Dr. Robert Oertley

McComb: So there were many opportunities to explore the Eastern Province, which we did. After Roger had left, a group of us in three Land Rovers went into the desert on a five-day Moslem holiday. Bob Oertley and his wife, the head of the Aramco exploration and his family, and one of the Aramco schoolteachers, and I made up the group. We headed south to the edge of Rub al Khali, the Empty Quarter, in an area of sand dunes. It's in areas like that where you find stone-age arrowheads just lying on the surface. I should have brought some to show you. I found many on that trip. It's relatively easy to find the arrowheads. With the shifting dunes, granular flat patches would be covered and uncovered. In these gravel plains you would find not only arrowheads but also stone axes.

People tell me when they first went out to the Arabian desert, particularly those who were associated with the oil exploration crews, they would pick up the arrowheads by the bucketful, literally. The area was largely uninhabited. If you were to look at a map of Saudi Arabia, the areas where there's water are where people live.

The types of local Arab housing found on the west coast of Arabia I didn't see until I was with University Associates. At that time I was traveling with a team to interview some of the health people who were working in those areas. The style of house is very different in the Western Province from what it is in the Eastern Province. Rainfall in the Kingdom is only about two inches a year. There are deep wells from which water is pumped to the surface. There is a period in the spring when sandstorms, some severe, are quite common.

Dr. Richard Daggy

McComb: Have you already talked to Dick Daggy?

Hicke: No, I am going to see him Sunday.

McComb: Well, I'm going to tell you a story on Dick Daggy. Dick was part of the group (including myself) that went out to Saudi Arabia in July 1973 with University Associates to participate in long term health planning for the Saudi Ministry of Health. He had previously been an entomologist and medical director with Aramco. He was the one who was instrumental in eradicating malaria in the Eastern Province of Arabia. When he joined the University Associates group, we visited a very big ain (Arabic for a large water well). While he was still with Aramco, he had gone to this ain located in Al Kharj, and seeded this well with tiny fish that would eat the malaria larvae. You've heard about seeding the clouds for rain; so he was seeding the ain to combat malaria. The edge across the top of the ain was about 150 feet, while the distance to the water surface was about 30 feet. What Dick had done many years before was to throw a whole lot of these fish in the ain. Eventually the fish got into the irrigation ditches that were on the surface of the ground above the well. He was interested to see whether those fish were still there and alive, since he never came back to see after the seeding many years before.

A big group of young boys were diving from the top into this ain. He went up to them, still remembering enough Arabic to ask them whether the little fish were in the pond. "Aiwa, aiwa." Yes, yes. And so we walked farther along to the little canals that come out, and sure enough the fish were there. Malaria was a big problem in Arabia, not just trachoma. You don't get good work out of people until you find that they're healthy. So I think Phil Gelpi's idea of doing this monograph detailing Aramco's experience in health care in the Eastern Province of Arabia is an important document. At the time of this visit to Al Kharj there was still malaria in the Western Province of Arabia in July 1973. We went to a place in the Asir or Western Province. To get there we drove over mountains in jeeps on dirt roads. When we got down to the coastal plain there, here was a brand new hospital which the government had built. Their well was full of dead things, and most of the staff had malaria. Then you realized that until the country solves some of their public health problems, they were not going to have a healthy population. Many of the people who lived in the cities, people of means, were doing pretty well, but in the outlying areas this was not true.

Other Personnel

Hicke: Who else did you work with in Aramco? You said you got wonderful support from Aramco, anybody in particular?

McComb: In the medical department Nadim Haddad was our ophthalmologist. Nadim was Palestinian Christian Arab. He and his family were among the group that lost their land in the 1948 war with Israel. Later, as part of work with University Associates, Ahmed Dajani, M.D., a Palestinian Moslem, added much to the development of a health plan for the kingdom. He too lost land in the 1948 war. You realize how peoples' lives just get shattered. But each one of them moved on to other things; it's amazing. It was a privilege to work with such wonderful people.

Arthur Bobb, M.D., was another Aramco ophthalmologist who worked with the trachoma team after Nadim Haddad left. Three Saudi male nurses were a key part of the experimental trachoma vaccine program team. They were Mehedi Hassan, Ibrahim Ali, and Abdulla Abdul Aziz. We needed bilingual Saudi clerks to do our record-keeping during field trips. We required people who were bilingual but spoke English well enough so that it would not be difficult for us to communicate. Roger Nichols was interviewing several people as possible clerks.

Hicke: He was interviewing for a clerk?

McComb: Yes, right. We were stunned when one young man told us during the interview that the world wasn't round, that when you got to Mecca, you were going to fall off the world. You know you had to be so careful, I mean none of us cracked a smile, but we didn't select him!

Hicke: You think that was a religious concept maybe rather than a lack of knowledge?

McComb: I don't. On second thought, maybe a little bit of both. How far such ideas existed in the general population--I don't think far, I really don't. There were many people who knew we came from the United States and they knew we didn't fall off the earth when we went home!

Hicke: There are some people in the United States that believe the world is flat, I guess, too.

McComb: But even Ali, our lab technician, told me once he'd been working in the Health Center, I guess helping out somewhere in the emergency room on the night shift. He described to me one

experience where he claims he saw a djinn (a ghost). But he was not superstitious, not really. Wonderful sense of humor, though!

He would play jokes on me. I liked lemon in my tea. Some days Ali would make the tea by boiling the water in a cylinder with a gas bunsen burner. Then somehow he conned Roger Nichols or vice versa (I never quite got the story) to spike my tea with something that was very tart. It was like lemon juice only sharper. This went on I guess for about a week. I kept saying something about this, "This tastes very sharp." Ali was very good, I mean he never squealed on the culprit, Roger Nichols.

Hicke: He never let on?

McComb: And finally, finally, I said, something is going on here and I want to know what. We had a little, tiny room where we did our staining of slides. It had a sink in it and all of our stains up in the cabinets. I cornered Ali in there one day and I said, "Now Ali, you've got to tell me what's going on." "Ah, no, no, Miss Dorothy, ah no, no." Well, he didn't lie very well, but he didn't tell me who was doing it either. Roger finally 'fessed up.

The other thing we did in the lab was to have a chess game. The chess game was set up on the lab bench used as a desk. It might take us a week to play a game. Moves were made as time permitted. It was sort of a nice challenge. Roger and I would play.

We really got a great deal of support from all levels of Aramco; even from the medical director and his staff and other departments such as Government Relations. The latter were critical in setting up working relations in the villages. We also set up visits to the Aramco women's clinic for the Saudi women and children. Aramco provided a separate building for them, because many of them came in with two or three or four children at a time. Their families were large. Sometimes they would have ten, eleven, or twelve children. I told Phil Gelpi that those women and children had better records of vaccination than the senior staff clinic in the main facility, because they had nurses that made sure each child's vaccinations were complete. If Nuha came in and this time she had three children, only one of them might have been in the last time. So the nurse would pull the records on all the kids, because you couldn't tell how often they would come in. If they needed a vaccination, they got it. Oftentimes their records were in much better shape than some of the American families.

II WINDING UP THE TRACHOMA PROJECT

Hicke: Well, there's probably more to say but before we go too far, tell me how you decided to wind it up. You actually found no conclusions other than that better living conditions helped the threat of trachoma?

McComb: Well, a lot of things were happening in Saudi Arabia and Harvard at that time. Roger came back to Harvard to become the head of the Department of Microbiology in 1970.

Hicke: Did somebody take his place?

McComb: Yes, Bob Oertley did, also a very good person, but he was only half time with the trachoma program. However, he could divide his time so that the vaccine program follow up that we did in 1972 was with him. Just remember "Three Blind Mice," that was Bob Oertley.

Hicke: Yes, that's right.

McComb: Lot of things happening in Harvard. Derek Bok by this time was president of Harvard. Jack Snyder left as dean, and I don't remember what year that was--it was right around that time. And the usual way is you pull together a search committee. Roger Nichols was on that search committee. It's too bad that Roger isn't here because I don't know all of the details, but I do know that that search committee made a recommendation to President Bok as to who the new dean of the school should be. That was not who Bok hired. And the physician that he brought in was the beginning of about thirteen years of chaos in the school. It was one of the reasons I left the School of Public Health in 1977.

By 1977, part of the expertise of the trachoma team was that we needed to share new laboratory procedures with others. Much of this knowledge was new enough that before I left, we had set up a training session for senior research personnel in other labs to learn our techniques. I wrote a manual to be used in the week-long exercise. We wanted them to go away with something that they

could refer to. They came from all over the U.S.; we had about fifteen or sixteen people. They were senior investigators. We set up both lectures and laboratory sessions and already had samples for them to do the tests. We sent them away with a "doggie bag" which had standard reagents which they could use as positive controls for making their own reagents.

The situation in the School of Public Health was sad in many ways, but you can't control the world. Within the School of Public Health itself, many of the junior faculty left--the people with the most promise. Eventually two-thirds of the senior faculty voted for the new dean to be dismissed. And at that point, President Derek Bok came across the river; because we were in Boston--the School of Public Health, the Medical School and the Dental School were all right in the same area in Boston--and the rest of the university in Cambridge. And he really told the faculty that they had no right to say that.

Hicke: He didn't care that they all left or were leaving?

McComb: I don't really know how President Bok felt about the faculty loss. I asked Elinor Nichols about this just recently, because it had bothered me. The dean was not a leader. In fact, he actually was caught telling lies about some events. Apparently Bok actually admitted at some point to Roger that he had made a mistake. It was the first appointment he made after becoming president of Harvard. About two-thirds of the new department chairs that the new dean brought on board eventually left. I don't know if President Bok had any sense of what public health really was. It's a very broad spectrum of discipline: everything from teaching health, biostatistics, tropical public health, nutrition, microbiology--everything you could tap into to do this kind of a project in Saudi Arabia. You needed to have a statistician who could look at the data; you needed many different kinds of people--those who knew a lot about women's and children's health, and so forth. If you don't get the best people in place, then you're in trouble. Anyhow, that was a sad time for all of us. It really was.

Hicke: And that was one of the reasons you wound up the trachoma project?

McComb: Well, the other thing I didn't mention to you, which is actually important, is that we applied for an NIH [National Institutes of Health] grant on trachoma and related diseases, and we were awarded one. I think it lasted ten years. This award allowed us to look not only at trachoma but the related diseases, such as inclusion conjunctivitis of the newborn and mammals that had similar infections. These microorganism vary from the one that we were isolating from humans in Saudi Arabia, but the course inside

the cells is exactly the same. We were looking at the broad spectrum of this group of microorganisms and its application to infections in human. This involved a lot of staff in the Boston lab, some of whom had also gone to Saudi Arabia as technologists. In fact, I did have a list for you because I had been in contact with many of the people who worked on it long after they had left Harvard. Most of these I had trained when they were in the Boston lab. Many of them went on to other careers in the health field.

There was Sandra Labas, now a vice president of Beth Israel Hospital in Boston. She went on to get her Master of Public Health degree in Texas. We found people who actually were excited about what they were doing and wanted to learn more.

Judy Whittum Hudson went on to get her Ph.D., and she's now associate professor at John Hopkins University and she's doing research on *chlamydia*.

Joan Barenfanger, who also did part of the work for her Ph.D. degree in Saudi Arabia, went on to get her M.D. and she's now a pathologist in Illinois.

And Pamela Scott, who worked only in the Boston laboratory is now a surgeon.

Michael O'Leary worked with Ed Murray on guinea pig inclusion conjunctivitis. So he wasn't actually on the program in Arabia but he was working on some of the materials that came back. He's an M.D. and a urologist.

Connie Pozniak was somebody that I trained. She did not go to Saudi Arabia but she worked on the Saudi material in Boston. She's now a veterinarian in Virginia, in Virginia Beach.

And lastly, Sara Murphy, who actually went on to be a physician's assistant.

Hicke: Is there anything we've missed now?

McComb: No, except I thought maybe you might like to see something that you don't need to include for this history, but which are samples of the documents and records used in the Aramco-sponsored Trachoma Research Program.

Hicke: Thanks, I'd like to, and many thanks for taking the time to record your recollections.

Transcriber: George Chen
Final Typist: Shana Chen

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Aramco Medical Department Oral History Project

Robert and Patricia Oertley

RAS TANURA, ABQAIQ, AND DHAHRAN MEDICAL FACILITIES:
1956-1982

Interviews Conducted by
Carole Hicke
in 1996

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Robert and Patricia Oertley.

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INTRODUCTION--Robert and Patricia Oertley

Pat and Bob Oertley jointly participated in this interview. Both had much to contribute about Aramco's Medical Department, Aramco society, Saudi Arabia, and each of their respective roles: Bob, as an Aramco physician; Pat, as one of Aramco's school teachers. And both had worked abroad prior to employment with Aramco. Dr. Oertley joined Aramco in 1963; Pat was already there--in Ras Tanura. And they had yet to meet.

Trained in general practice, Oertley was first assigned to the clinic/infirmery in Ras Tanura. Bob and Pat first met in 1966; within the year, they were married. And both ended up working in Abqaiq before settling in Dhahran. Then, successively, Bob became director of the Abqaiq clinic/infirmery, head of Preventive Medicine, and finally, field director of the joint Harvard/Aramco trachoma project during the seventies.

Bob had a nose for epidemiology, which comes through during this interview, making him ideal for his assignments, both to Preventive Medicine and to the trachoma project. He and Pat left Dhahran and Aramco in 1976 to find a new home in central Oregon.

Armand P. Gelpi, M.D.

December 9, 1997
Sonoma, California

INTERVIEW HISTORY--Patricia and Robert Oertley

When Robert Oertley joined Aramco as a family physician in 1963, they assigned him to Ras Tanura. There he met Pat, who was teaching school. They were married in Beirut in 1966. Pat ended her official teaching job at that point, but she taught art as a "casual" employee in Abqaiq. Bob was soon assigned to Abqaiq, then to Dhahran. Along the way he acted as field director for the trachoma project, director of Preventive Medicine, and director of Tapline medical services.

The two were interviewed in their home in Sun River, Oregon, on August 18 and 19, 1996. They gave excellent descriptions of life in Saudi Arabia, especially in the outlying clinics. They reviewed the transcript and added some information.

Carole Hicke
Project Director

January 1997
Regional Oral History Office
University of California, Berkeley

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Room 486 The Bancroft Library

University of California
Berkeley, California 94720

BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

Your full name PATRICIA EDNA CERTLEY

Date of birth OCT. 9, 1927 Birthplace Pensacola, Florida

Father's full name Cecil Eugene Webb

Occupation retailer Birthplace Atlanta, Georgia

Mother's full name Virginia Bucklin Webb

Occupation housewife Birthplace Vicksburg, Miss.

Your spouse Robert Eugene Certley

Your children none

Where did you grow up? Lincoln, Florida

Present community Seaside, Oregon

Education BA St. Mary's College, Notre Dame, Indiana
MA Columbia University, NYC

Occupation(s) artist

Areas of expertise various media, but especially
large, variegated landscapes

Other interests or activities reading, traveling

Organizations in which you are active none

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BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

Your full name ROBERT E. OERTLEY

Date of birth 22 MAY 1925 Birthplace PRINCEVILLE ILLINOIS, USA

Father's full name FLOYD EUGENE OERTLEY

Occupation FARMING (AGRICULTURE) Birthplace PRINCEVILLE ILLINOIS USA

Mother's full name LULA ELEANOR GRAY

Occupation TEACHER → HOUSEWIFE Birthplace PRINCEVILLE, ILL USA

Your spouse PATRICIA EDNA (NEE WEBB) OERTLEY

Occupation TEACHER Birthplace _____

Your children HEIDI OERTLEY, KAREN OERTLEY PHERA, DVM

LORI JANE HOLSCAW JILL DIEDRE SWIFT

Where did you grow up? POCAHONTAS COUNTY, IOWA

Present community SUN RIVER OREGON

Education BA CORNELL COLLEGE ^{M.D.} STATE UNIV OF IOWA
MT. VERNON IOWA IOWA CITY, IOWA

Occupation(s) MEDICAL DOCTOR, EPIDEMIOLOGIST

Areas of expertise EPIDEMIOLOGY

Other interests or activities WOODWORKING, READING
AND TRAVEL

Organizations in which you are active NONE

I BACKGROUND

[Interview 1: August 18, 1996] ##¹

Childhood on the Farm

Hicke: Will you start by telling me when and where you were born?

Oertley: I was born in Princeville, Illinois, on May 22, 1925.

Hicke: And did you grow up in Illinois?

Oertley: No. My mother and dad moved to Iowa while I was still a baby. In fact my dad preceded my mother's and my travel. He took the livestock to Iowa and accompanied them on a freight train, and then sent for my mother and me. We didn't go on a freight train. I'd see these trains later as I was growing up, the same train for years.

Hicke: Was it the Rock Island Rocket?

Oertley: No. It was the Chicago Northwestern. By the time it got off to Iowa it had become another line, and I can't remember that name. But he sent for us and we arrived there by train. I don't remember any of this; I was still a baby.

Hicke: Yes. What kind of livestock did he bring?

Oertley: Cattle and hogs, mostly cattle, and I think a couple of horses. This entailed the actual cars that contained these animals to be switched to other lines. Of course I don't remember any of this but it's been told to me. But we--my

¹This symbol (##) indicates that a tape or a segment of a tape has begun or ended. A guide to the tapes follows the transcripts.

mother and I--followed later as soon as dad had the place settled in. He had a cousin, his mother's sister, who had married into the Hartsock family and they already had--it was H-A-R-T-S-O-C-K--a farm across the road from us: one was two hundred and forty and one was two hundred acres, I guess. They were already Iowa residents for some time. At any rate, my father decided that the farm that the Oertleys had in Iowa should be farmed by the descendants thereof, and that's how it happened.

Hicke: Whereabouts was this?

Oertley: In Pocahontas County, five miles from a place called Havelock.

Hicke: And did you then grow up on a farm?

Oertley: Oh yes, and went to a country school a mile west of us. Walked to school. My father had a Klondike, which is a kind of chariot wagon, covered with a roof and rein slot under the windshield for the reins for the horse--that's R-E-I-N, not R-A-I-N. The school rarely had more than a dozen youngsters at one time. It wasn't limited; it was just that there were not anymore than that to attend. It was always a female teacher who covered all the grades that there were.

Outhouses--you held up one finger for one activity and two fingers for the other, because this meant that you were going to be a little longer. [chuckles] The directorship of the school rotated among the farmers whose families used it, and the director then housed the teacher during that year or years that she taught all grades that there were. I remember that the year my father was director I got more rides to school than before.

Hicke: The teacher lived with you?

Oertley: Yes, there being no other accommodations, the teacher always lived in the home of the current director. It was a dirt road and it was a mire of mud in the spring rains, almost impossible to negotiate with a motor vehicle--horse-drawn buggy being the only suitable recourse when the road was muddy gumbo.

Hicke: So you usually had to walk.

Oertley: Yes, you had to walk or get a buggy ride. We did have a buggy.

Hicke: You had chores to do after school?

- Oertley: Oh yes. They weren't heavy while we were living on that farm. It was mostly a matter of feeding the chickens, gathering the eggs, and taking care of the younger livestock, making sure they were watered and corn or oats or hay was in their feed boxes.
- Hicke: You had to get up pretty early, though.
- Oertley: Oh yes. I can't remember the hour. It wasn't that significant to me as an hour at that time; it was a matter that it was time to be up, and in winter, we were always up long before daylight.
- Hicke: Where did you go to high school?
- Oertley: We moved to another farm when I was in sixth grade and it was closer to the town of Havelock. In fact, instead of being six miles away, it was merely a mile and a half. I could walk to school, but a bus came by. It seemed like that was a real advancement as far as I was concerned. Boy, things were looking up.
- Hicke: What kinds of things did you enjoy in high school?
- Oertley: I never enjoyed team sports. In country school we didn't have that kind of exposure. By the time I was in the town school I was entering high school, practically. I enjoyed the spell-downs. I usually got to the County Bee level, but never won in the final endeavor. [chuckle] But I tried hard. We had a lot of winter snow and I loved the sports attending thereto: the sleds down the hill and all that sort of thing, and even clamp-on ice skates on the frozen puddles and things of this sort. I can't think of anything else that pertains there.

Cornell College

- Hicke: Eventually you started thinking about becoming a doctor. Was that in high school or was that later?
- Oertley: Actually, it was in college that I thought of that. I always liked math and the engineering kinds of subjects, and I loved to watch my father fix things--things on the farm were always breaking down. I enjoyed that and I decided by the graduation from my high school that I was going to be an engineer of some sort. I didn't really even know all that engineers aspired to or were capable of, but it seemed like the thing that I wanted

to get into, something that worked by mechanics and where you did things with your hands. So I went away to Cornell College in Mt. Vernon, Iowa with the idea of becoming an engineer in the long run. I took all the science subjects that I could. But it turned out that with my first exposure to biology, I began to be interested in perhaps being a doctor. But I didn't tell anybody. It really wasn't appropriate, I felt, for me to be thinking in that direction, but maybe, you know.

Well, I went on with that idea and I got all the biology and organic chemistry courses that were available to me at Cornell, and by the time I did mention it to my parents-- "Rather than engineering, I think I'd like to study medicine" --they gave me encouragement. Once it was disclosed, it became easier to proceed with a little more aggression in that direction.

Hicke: You were afraid that they would--

Oertley: I felt that they would support me in anything, but I knew it was going to be expensive. Although I only had one sibling (a sister, Virginia, four years younger than I), farms weren't all that profitable then in the days I was growing up. It was during the Depression, and we had realized that it was probably going to cost some money, so I mentioned it only sort of late in the game. I knew I had first to successfully complete four years of pre-med college with an appropriate science or biology major.

It worked fine. My folks were very encouraging, in retrospect, and I didn't have to be concerned about it. In fact, they were very happy. Dad, even before I got the M.D., would always introduce me as: "Oh, this is Bob. He's my son. He's going to be a doctor." [chuckles] It began to be embarrassing. He was taking more pride in this, almost, than I was...and I had it yet to accomplish!

Military Service

Hicke: By the time you graduated from Cornell, you had come to this conclusion?

Oertley: I didn't graduate from Cornell. The army came along. In my junior year I was off to the army to Camp Roberts, California, Fort Benning, Georgia, Fort Meade, Maryland, and 473 Infantry Regiment in Italy. The decision, the real decision, to become

a doctor sprang, I think, solidly, when I was in Italy in the infantry and I woke up in a field hospital in northern Italy. Obviously, not mortally wounded, but I did lose my hearing; retrospectively, it's been very apparent that that's when it started. I had tinnitus, the ringing in the ears, thereafter. Under some shell explosion, I had minor, superficial wounds, but strong tinnitus thereafter and reduced hearing.

Within weeks after getting out of the field hospital and rejoining my infantry battalion, the war was over in Europe, and I was among the first to be transferred back to the States, because I was young, and I was to be retrained for war in the Pacific theater. But on my way across the Atlantic, getting to the States, the newspaper aboard this troop ship told about "atomic [AT-omic] bomb drops on Japan." I didn't know how to pronounce atomic: the word was atom and atom-ic, so-- [chuckles]

By the time we landed, I thought, "My goodness, the war is going to be over and I'm going to be able to get back to school." At this time I was a staff sergeant. But the army decided that I should be staying on and retraining other troops. And I had a very hard time talking my superiors into ultimately letting me out. Time was wasting and I was not getting back to school like I'd like; I was working for a master sergeant, processing other people's orders. I kept imploring him to put mine forward, and he wouldn't. He said, "You've got it made. You've got it made. Your future's secure." And I said, "In the army? Who wants to be secure in the army?" [laughter] But he didn't consider that patriotic talk, almost, you know.

So finally one night, I typed up my own orders and put them on his desk. And I said, "Please. Please sign these. Time's wasting. I could be back in school." And he said, "So you're really convinced; I'll sign it." Then I had to go through the physical. In the physical--this was the joke part of it--he then pointed out to me, "Oh, but you've got a tremendous hearing loss. You ought to make the army your career. You're not going to make it out in the real world." Again, the argument went on.

Hicke: He wanted you.

Oertley: Well, he was a lazy kind of fellow, and I was doing a lot of his work. He was off playing golf or whatever. I was his captive. But I finally succeeded and was honorably discharged, and was free to re-enroll in Cornell College to complete my pre-med education.

II BECOMING A DOCTOR

Medical School, University of Iowa

Hicke: Back to Cornell?

Oertley: Yes. And then I attended year round--classes in summer school as well. After two years, then, I applied to medical school at the University of Iowa and was accepted upon their receipt of my transcript of credits. Medical school went very well.

Hicke: What year did you graduate?

Oertley: It was in 1951 from State University of Iowa College of Medicine, by combined course; I entered without my B.A.

Hicke: How did you do that?

Oertley: Actually my science professors (and particularly Dr. Frank Brooks, Head of the Biological Science Department) at Cornell College were sufficiently convinced of my ultimate aspirations that they provided great guidance in appropriate course selection at Cornell College, so that by the end of my third year, I not only had completed all of the required undergraduate courses with high grade points, but their support in recommending me as a student prepared to undertake the medical curriculum for an M.D. [pause]

Hicke: Let's just go back over that again. You submitted your application to the University of Iowa and you didn't need a B.A.

Oertley: Yes, the University of Iowa Medical School at Iowa City.

Hicke: Did you specialize in anything?

Oertley: No, it was a straightforward, four-year course in the college of medicine; it was for an M.D., with or without the B.A.; it was a four-year course. It went well. I enjoyed it immensely. The classes were tough. We had one classmate who committed suicide in our first year.

Hicke: Oh dear.

Oertley: His parents were both doctors and we (his classmates) didn't know his parents. We had a feeling that they were perhaps unduly pressuring him into a direction he didn't want to go, and he didn't know how to get out of it any other way. This isn't necessary in this bio certainly, but it was something that caused us all a bit of a shudder. He was somebody who we knew quite well, and three-quarters of the way through his freshman year, he committed suicide.

Hicke: Did it make you think more seriously about whether you wanted to be a doctor?

Oertley: No, no. It didn't cause me or anyone else to consider a course change. I think we all assumed that since his parents were physicians, he might have entered medical school not by his own volition. Now he was feeling the strain was too much and didn't know any acceptable way out. At least we (his classmates) ascribed it to that. No investigation was ever undertaken that I know of. Nonetheless it was sobering. That was all.

Medical school was tense. We all felt it. There was a fraternal spirit among us all, including the six women who were in the class. There were eighty-four males and six women. The orals were the tough part. Anatomy dissection initially was a little bit more gruesome--it was something you had to get used to: dissecting a human body and literally isolating the nerves, following them on down, and not cutting into something else. And constantly the instructors coming around saying: "Show me the cranial vestibular nerve on your cadaver." "Yes, sir," you know. And then we'd nervously "tease" this delicate strand of neural tissue free from its neighboring tissue. "All right, give me its origin and tell me where it's going and its specific function." It was tense, because of the mass of information you were trying to master, and anxiety about which question would be forthcoming next.

I didn't enter a fraternity, because by this time I was already married to a girl from Cornell College, Jean Beaumont. So I wasn't living in a fraternity house, but I began to feel almost like I should be there: they're studying together;

they're burning midnight oil and going over the upperclassmen's notes from the years before and other similar study advantages. But I got along all right, even though the exams were strenuous and nerve-racking. But it began gradually to fall into place and became easier. And as each year went by, I felt more and more secure, and more satisfied with the decision I'd made, and particularly when we began to see patients in the last half of the junior year in the university hospitals. In the final two years, we were charged with increasing responsibility for care to hospitalized patients. We were responsible for doing the admission histories and the admission physical exams on new patients, and writing our findings in the actual chart of the patient. Now we were getting our hands and minds in direct contact with live patients.

That direct professional contact with ill patients was exciting, and the onus was on each of us not to miss any significant detail in their medical history, nor any aberration from normal health in our physical examination. And we were to write in the patient's hospital chart a complete description of our findings--from head to toe. Then to order in the chart what we felt to be necessary in the way of lab work, what x-rays if indicated, and plot a course for managing the patient care. You can imagine the anxiety we felt--that we might miss some significant symptom or sign that would give a clue as to the diagnosis of an alternate or secondary health problem which, if not managed properly, might jeopardize the patient's recovery.

Also, we were aware when we had passed the tough milestones. They weren't spelled out in any way, but you knew now that you were being accepted by the instructors. At first they were doing a weeding-out process. Nobody really said anything about it, but you were aware by their responses to your questions, or how your responses to their questions were received. They might even go so far as to say: "Now I wouldn't quite put it that way. Here's the way you really ought to look at that." The oral exam became an instructive device rather than a destructive device.

With the exception of three--the one suicide and the two people who dropped out of their own volition--we all made it; nobody was actually kicked out. Those three lost were expected almost, by the rest of us. We could sort of tell that they just weren't cutting the mark; it's probably apparent to students in all vocational aspirations. Any rate, eighty-six of the original ninety aspirants made it.

Internship

Hicke: You graduated. And then what did you do?

Oertley: I must add that during medical school, it turned out that I undertook medical R.O.T.C. also. Without going into excessive detail about that, we spent a summer--those of us who were in that program--at Denver, at the Fitzsimmons military hospital out there. I'd never before been west of the state of Iowa, and I concluded that I would choose a Denver hospital in which to do my internship, and I selected St. Luke's Hospital in Denver.

The internship was marvelous. At this internship, one of the other ten interns was Lyle Olson, who was a graduate of Wisconsin University. I had particularly liked the pediatric portion of the internship, so I decided I was going into a pediatric residency. But Lyle had decided that he and I should practice together, and he wasn't about to go on in a residency toward a specialty. He implored me, saying: "Come on to Wisconsin with me. You can always take a residency later and specialize if you want to, but I know a place that we can go." So with a little more encouragement from him, I did, and we went to practice in a county seat town in Wisconsin: Darlington. It was a very successful family practice. Indeed, after completing two years, we took on a third partner, another new graduate from the University of Wisconsin, Fred Ruf. It was a very gratifying practice in a very warmly receptive community. We enjoyed the rotation of nights and weekends on call--every third night and every third weekend on call was much less exhausting--and our community of patients seemed to like our trio of practitioners.

Work in the Belgian Congo: 1963

Oertley: Then I learned about a need. The Belgian Congo was in an uproar: the natives were restless, as it were, and a number of Belgians were going back to Europe. Among them were many of the professionals, including doctors. This appeared in a medical journal and also in one of my church journals, at the same time, that they needed doctors. So I figured, gee, getting that info from two different directions, maybe I ought to respond, and it might be quite exciting. Also, at that time, my marriage was breaking up. Without addressing it

further, it was about to dissolve, although we had four daughters.

I took a six month leave from my partners and I went to the [Belgian] Congo. It was a very exciting practice. Dr. John Zook needed help. Dr. Zook's father was a missionary in the Congo and John was born there--got his higher education in U.S.A and returned to the Congo as a missionary doctor. He had been born to missionary parents in central Africa.

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Hicke: What did you do? Did you see the patients there?

Oertley: There was a small hospital, with x-ray and an operating room, which was used for minor surgery, compound fractures, Caesarean sections, and so forth. We held clinic hours for outpatient care, seeing patients; we were doing various kinds of surgery, setting bones, doing regular general practice, but we were also treating malaria and smallpox, of all things. I mean handling smallpox, because they just hadn't been immunized and I'd never seen a case of smallpox. Not even in medical school. Things like that are kind of exciting in their own way. That was a six-months tenure, and during that time I had the--what should I say?--the gall or the nerve to write Dr. [Albert] Schweitzer in Lambaréné [Gabon], because they are contiguous countries, the Belgian Congo and Gabon (both countries sit astride the equator), and I asked if I might, on my way out of Africa, stop by there and see their operation. I got an affirmative answer from him, and I did go there, spending about ten days in Lambaréné on the way out of Africa. Dr. Schweitzer died within the next year; so in retrospect, I am thankful that I availed myself of that opportunity to meet that remarkable personage.

I got a chance to compare their operation with the one I had just come from, and they were different. They had a number of doctors who were coming and itinerating there. I didn't know that that's what they were doing, that they were coming out of various churches, working there for a week or a year or whatever. My stay there was merely observing for that week.

I remember one funny thing. I was housed in a sort of barracks-like situation for the time I was there. This was right on the equator. There was a huge spider on the wall above me, and I was sure this thing was going to--while I was asleep--drop down and perhaps bite me. Was it venomous? I got up to kill it and I thought, No, "Reverence for All

Life"--that's what Dr. Schweitzer stood for. I thought, If they find this flattened gooey, big spider smashed on the wall tomorrow morning, I'm out of here. [laughter] And so I let him live. He didn't bite me.

Hicke: Did you move him out?

Oertley: No, but I did my best to encourage him to leave. I finally decided, "I'm really risking more than if I just go back to bed."

Hicke: I guess that's called "When in Rome, do as they tell you to do."

Oertley: But enough of that.

III ARAMCO: 1963-1982

Joining Aramco

Hicke: So you went back to the States then?

Oertley: Yes. Another good friend, Dr. Roger Nichols, stopped to see me first, on his way to Arabia, and then he cabled me: "As long as you've uprooted once and as long as your marriage is null and you've got your kids in schools and so forth, why don't you come out to Arabia and put in a little stint? Because it's exciting medicine." This was about a year or so after getting back from the Congo. So I told both my partners to take vacations, that I was going to leave again. They were getting used to this. [laughter] It made it easier for me, because there was a group practice established and they could continue on; also, I wasn't leaving specific patients behind. I had a lot of encouragement from the community. They were nice about it. They thought it was exciting. But I never got back to Wisconsin again. [pause]

Hicke: This was 1963? Didn't you say you went out there then?

Oertley: Yes, about that.

Hicke: How did you get hired?

Oertley: Let me think here now.

Hicke: Somebody must have interviewed you.

Oertley: To get to Arabia with the Arabian American Oil Company (Aramco), you could just submit an application to the Aramco office in New York, and their only stipulation was, as far as even looking at your application for work, that you had to be willing to go for two years.

P. Oertley: I think Roger interceded. It was Roger's idea. I think Roger got in touch with them. They didn't even send an application; they said something like, "Come to New York for an interview." I think it was just about that simple.

Oertley: At any rate, I went. As I say, there was this two-year stipulation; this wasn't going to be just a couple of weeks or a three-month tour or anything of this sort. So, I had both my partners take vacations and gave Aramco a time that I would be available at that point in the future. I went overseas and, shortly after getting there, I met Pat. Pat was already there, working with the--

P. Oertley: And the rest is history.

Hicke: [laughter] Well, that's what we're here for. But first of all, when you got to Dhahran, what was it like?

Oertley: Well, it was hot and dry, and there was the *shamal* in the summertime, which blew the wind from the north. Dust would sometimes make the day gray, but hot nonetheless. The people who were there were very interesting--the Americans who were out there working and the people of other nationalities. There were Europeans there too, and then of course the Saudis.

Hicke: Do you recall any particular people?

Oertley: I'll bring that up later.

Hicke: Well, as we go along, if people come into it, you can tell me about them. What did they put you to doing when you got there?

Ras Tanura Clinic: Family Physician

Oertley: I went to Ras Tanura. You've probably run across that already.

Hicke: I have, that one. But I appreciate all this spelling help, a lot of them I haven't.

Oertley: I was the American physician for the American community essentially. That's what I was hired for at Ras Tanura. There was already an American chief of that clinic. Dr. Bob Armbruster, wasn't it?

P. Oertley: Yes.

Oertley: Dr. Armbruster.

Hicke: So it was a clinic.

Oertley: It was a clinic.

Hicke: Primarily for Americans?

Oertley: No, it was for the entire work force and their family members. The Saudis often had large families.

I was working there essentially as the American physician for the American community, but you were on call, and on your turn on call, you were seeing everybody on those nights. I became intrigued: I found the work was of good quality. The people who had started the Medical Department had done a good job of establishing good controls, good medical demeanor, and it was very satisfying work.

Hicke: What would a typical day be like?

P. Oertley: First you caught the bus, and there was the bus driver who sometimes wouldn't stop for people because he was late.
[laughter]

Hicke: Oh, dear.

Oertley: That's true. It made the route through the community, out to the refinery, out to--Ras means "cape," and there was a long peninsula. This was where the oil that was collected in Aramco came by pipeline to be processed. It went out this long cape, which was a skinny cape, literally, to where the pipelines connected with ships.

Hicke: Oh, it went right out to the ships.

Oertley: Yes. Pat and I met there.

Hicke: At Ras Tanura?

Oertley: Yes. Pat introduced me to walking the beach and observing the fish and wildlife of the waters there. I got more and more interested in Pat and less interested in the water.
[laughter]

P. Oertley: That's very precious!

Hicke: How flattering!

P. Oertley: Yes.

Hicke: Well, anyway, assuming the bus picked you up and took you to the clinic, what was the clinic like?

Oertley: It was a very well-designed structure. It turned out there was one in each of the three districts. The two smaller districts, Ras Tanura and Abqaiq, had smaller clinics. They had beds for about ten to eleven, twelve people only as far as overnight. Otherwise, they'd go to the main hospital, which had two hundred beds, in Dhahran.

We were taking care of the Saudis who were in the immediate area and had moved there to work at this refining complex, and the American community. We had other Arab physicians in this clinic. I think there were eight or nine.

P. Oertley: Indians as well.

Oertley: And Indians, yes, from India. They had an American director who left there shortly thereafter, Armbruster.

P. Oertley: And then you were the director.

Oertley: Yes, I replaced Dr. Armbruster.

This group of physicians was very carefully screened and chosen. Most of them were Indian, Egyptian, Jordanian, and Lebanese. That covers it.

Hicke: What kinds of cases were you seeing? What illnesses?

Oertley: Well, the routine kind of things for general practice: the tummy upsets, the fractures. It wasn't as exotic as one might expect. There were certainly oil company accidents that were different. Even they weren't that strange, but injuries that would occur in any processing plant: having a finger ripped off or another kind of injury or a rollover in a vehicle and that kind of thing. It was essentially an American community in each of the three districts, but there were European laborers who didn't have family members with them, who also lived in bachelor housing.

Hicke: How about the Arab women? Were they coming in with pregnancies?

Oertley: Oh, definitely. See, any Saudi who worked for the company was eligible to bring his wife or wives into the clinic. He could have up to four, and as many children as they could produce. So that was really an extended family. That was the really exciting part of it in the long run. The rest of it was medicine as I'd seen it elsewhere, it was just in a different climate. But the Saudis who worked for the company got their total care and total family care. It didn't cost them anything. There was no money exchanged at all at any of the clinics.

Hicke: Were they having different kinds of illnesses?

Oertley: Yes. Because we were living in the tropics, certainly, and two kinds of malaria were endemic: *Falciparum* and *Vivax*. But then there were all kinds of local nostrums being used from classical days and available from street vendors who were simple merchants without any training--who had acquired from equally uneducated suppliers the nostrums that they purveyed.

Hicke: Oh, that's interesting. Can you tell me about any of them?

Oertley: Sometimes you didn't know why this person was ill, and it may have been even an imaginary illness that started it, but now they had taken some medications obtained from street vendors, and now they really had an illness.¹ Very interesting kinds of interconnecting problems that Aramco clinics had to sort out.

Hicke: So diagnosis was a problem?

Oertley: Yes, but this added interest.

Hicke: Did you eventually find out you had to ask them what they'd been taking?

Oertley: Oh, always you had to. Of course, you had to do this through an interpreter. At least I, as an American whose only language was English, did. We had Arab-speaking physicians who had graduated from schools in Lebanon, and they were very good physicians. They were well chosen, selected, and signed up in Lebanon. They were selected for being top of the class and also the fact that they could speak very good English. That perhaps was almost as important.

¹Patients' illnesses became compounded by having taken some exotic concoction as therapy.

When I first arrived in Arabia I was assigned to the American/European clinic in Ras Tanura where I would be seeing American patients--the American workers and their families. But when my nights on call came, I was seeing the same gamut as everybody else, but with a nurse interpreter, who was usually a male or female nurse of Lebanese or Egyptian origin who'd been educated and trained at AUB, American University of Beirut. I found that stimulating and exciting, albeit different, because it took a little longer to get all the information you needed. The examination of somebody with a stethoscope was the thing and all that, going over them, but you need more than that in medicine.

Hicke: What kinds of things did you find they were doing at home? Would they be like herbal medicines?

Oertley: Well, I'll give you a couple of good examples. A baby was brought in; it was terribly anemic. Looking at the blood cells under the microscope, the red blood cells were stippled, which indicates a very specific problem: lead poisoning causes deposits of lead to accrue in the red blood cells, just the red blood cells. They are otherwise without a nucleus, so all you have is this nice, red disk, and it was stippled. You don't need a special dye even to see it. So this one baby came in grossly ill, pale, anemic, skinny, definitely failing. This wasn't at Ras Tanura, I should say.

Hicke: Well, since we're talking about this, please continue.

Oertley: It happened to be on a night that I was on call. Going over this child, the stippling tipped us to the fact that this had to be lead poisoning or something very similar to it. So I tried to find out where the kid got his lead. I mean, after all, it was a nursing baby. It turned out the mother had cracked nipples earlier on, and she'd gone to a local nostrum dealer. She gave her complaint to him--and he was not a certified druggist or anything of that sort--and he gave her this paste, which she was to put on her nipples as a healing ointment.

Aramco had good labs. I mean, they really had them for all kinds of things in the oil industry. We took this sample to them for analysis. First, we stopped her from using that; we weren't quite sure that this was the cause, but this had to be integral somehow. The lab reported it was a lead paste. And this kid had lead poisoning, and he was failing. It took some time to leech out the lead that he had already consumed. He did survive, but he was in the hospital for a while. We got him on formula just because it was the only way we could

keep him in the hospital. He did survive, but he came very close to--I'm not sure, even to this day, that as he matured, that he might not have had problems. You can't leech it all out, and some of this is deposited in cerebral tissue and so forth. Nonetheless, there were things like that that occurred.

Hicke: That's an interesting example.

Oertley: Then, on the basis of this, I went to the Eastern Province director of health, who was Dr. Shishakli, to tell him about it, and was able to get the husband to give us the ointment canister. He had actually gone home and thrown it away. But I told him, "We need it, because we need to inform others."

Hicke: Is this for Aramco or is this the government?

Oertley: No, no, this is the government in the local village. He got hold of the man who had sold this ointment to the woman and put him in jail. When I'd go in and talk to him for a little while, "Now, you know, this isn't going to change very much. What you really have to do is make sure that this druggist knows now that this can be dangerous, and he ought to be more selective in what kinds of things he uses for unguents. There are probably others out there. What you really ought to be doing is making sure that they know too." So then he would proceed with this. He got to be very good, as a matter of fact. We had a good relationship, and we did get the guy out of jail and, likewise, properly informed about dispensing, utilizing a couple of our Lebanese, Arabic-speaking physicians for that objective.

Abqaiq Clinic: Medical Administrator

Oertley: Incidentally, similarly interesting things were happening all the time. Another interesting affair happened when I was assigned as director of Abqaiq Clinic in Hofuf, an Arab town to the south of Dhahran.

P. Oertley: You received a call from a nurse in Hofuf, and she said that a lot of people were coming in--

Oertley: --sick. All had similar stories--

P. Oertley: All happened at once, and there were lots.

Oertley: So I went down. They bake bread, first of all, by just making big, flat patties, thin as a pancake, about ten to twelve inches in diameter and then putting them in a hot oven, which is actually a barrel which had been salvaged someplace. It had a gas burner attached to it, the hot flame inside the drum. Then they slap these patties of bread up on the inside wall of the hot barrel, and then with a metal tong reach in a minute or so later and peel them off. They were large, round, brown and white. They were very good; I loved them. But it turned out on this instance that I went there and found that the man that was making the bread was also ill.

P. Oertley: That's the only thing they had in common.

Oertley: Yes, right. Also some of the ill persons remembered that the bread they'd eaten had an odd taste.

P. Oertley: And one of the families had some bread, and you smelled it.

Oertley: And you could smell an odor like fuel oil or kerosene in this. It was the flour! The flour was soiled with kerosene. You could see it; it was caking the flour on the one side where it had been spilled, and we could see it when we reached the first bakery; and then we went checking up. It turned out that the baker himself was ill from eating his own bread.

It turned out that as we investigated all this, the flour was American flour; it had come in on a ship and had been transhipped from the Persian Gulf onto a smaller ship to be brought in to the Gulf where it was offloaded at Ras Tanura. The flour was caked in there. You could smell the kerosene; it was literally kerosene. How it avoided the kerosene itself causing the conflagration in the ovens was beyond me, because it was an open fire in the thing. And some of it apparently did.

What happened as a result of this, I felt very guilty. The police were following me around, basically. They knew what I was doing. I've forgotten whether I reported to them or whether somebody said, "The American Aramco doctor is here." They also knew that people were ill. They had already hauled this baker off to jail, who was really innocent except he used these soiled flour bags. He should have been a little more suspicious. And he was sick, also.

The upshot of it all was that we got him out of jail, but then suddenly they were looking for the American supplier of the flour. And now I'm in the position of having to defend the fact that the flour wasn't made with the kerosene: it was

somewhere in shipment that it got this way. It turned out that it was a ship that had come in, transloaded this onto part of its cargo, and was also carrying barrels of kerosene. Somehow on shipboard, I've forgotten how, the two got mixed, but nobody was really culpable except those who didn't know how to load a ship and needed to recognize that these things must be separate.

So then I went in and talked to the local Eastern Province director of health, Dr. Shishakli. We sat down and had coffee and went all over this: "Now, the way to do this isn't to put the baker in jail; that doesn't solve your problem, particularly when he's already sick from the same thing." He was a very intelligent man and we got along very nicely through the years. He was very tractable. He was glad that--

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P.Oertley: They had gone--you, your investigators, and the police following you--had gone to the warehouse, because the baker told you where he had bought the flour. So he'd bought his flour from there. Eventually, this story became sort of important, and it was reported to the World Health Organization; and it all had to do with the fact that there should be some control over the storage of edibles--

Oertley: --comestibles, yes--

P. Oertley: --yes, I'm looking for that word--comestibles?--foodstuffs, anyway, on international freight; because in this case, the boat was on its way to Pakistan. There was that in it too.

Hicke: So that was a significant bit of investigation you did.

P. Oertley: That's right.

Oertley: It was fun. You didn't know you were even doing any investigation. You get out here and you find that the baker is sick. The mothers came in with the families who were ill, and they brought the bread that didn't smell good. Then it was a matter of going out to this area--where is the baker where you got it from? And he wasn't working; he was sick. He'd eaten his own bread. [chuckles]

P. Oertley: And we were in Abqaiq at the time, which was another of the districts, the one more inland, which is where all the roughnecks were. By roughnecks, that's a term that people in there--

Hicke: There's an oil rig there.

P. Oertley: It was not a rough community, but it was less polished than the other two, where you had more engineers or petroleum geologists or whatever in those other areas. Well, in Abqaiq about the time this is going on, the interesting thing about it was if you went to a party, one group would say, "Hey, this is what happened to us today." I remember the one where even the host was absent, because there are islands in the Gulf that are under dispute between Iran and Saudi Arabia, and at that point, I guess a couple of the Aramco boats had been out in the area and they'd been boarded or taken over. So they had Aramcons held by Iranians on some of the islands.

There were groups going to Abqaiq to help with this business of going to Hofuf to help with the investigation that Bob was involved in; and then there were others that had to go out into the Gulf and do political and diplomatic stuff to get the men out of jail.

Oertley: It was great fun living over there.

P. Oertley: That was exciting. That didn't happen every day.

Oertley: Those were events that became epochal.

P. Oertley: And they talk now about the fact that some of the islands in the Gulf are under dispute with Iran. And on television the other night I heard that they sent five thousand--which is a huge number of planes--the U.S. sent five thousand planes over into that area to beef up the force because of this threat. I was thinking this threat's been going on probably for--they've had those islands under contention for centuries.

Hicke: They are not going to solve that problem right away.

You have some other good stories. Do you want to discourse on those?

P. Oertley: Fahad Matlaq?

[discussion of spelling of the name]

Oertley: You can spell it almost any way you want with the vowels. Actually, in Arabic they write with all consonants and the vowels are simply a, i, and u, and that means a little mark over the consonant that is followed by that sound.

Hicke: Oh, that explains why there are so many different ways to spell some of these things.

Oertley: Yes, exactly.

Hicke: Okay, so who was Fahad Matlaq?

Oertley: Fahad Matlaq. I have to back up.

P. Oertley: We're still living in Abqaiq.

Hicke: We never actually moved you, but we're getting good stories. We never actually moved you from Ras Tanura to Abqaiq.

P. Oertley: You were only in Ras Tanura until '66, only three years. Because then we got married and you moved.

Oertley: I've moved to Abqaiq and then later to Dhahran.

P. Oertley: So the business about the bread that was at Abqaiq. This also is Abqaiq.

Oertley: No, Pat. We were in Dhahran. Fahad Matlaq drove all the way from Rafha, the third station northwest along Tapline [Trans Arabian Pipeline]. What's the first station on Tapline? I can't think of it. Hang on a moment. [tape pauses]

[This material inserted from written document.]

Oertley: Within the perimeter of the tether of his favorite Arab horse, which was staked out to graze, Fahad one morning found the stomped-to-death carcass of a feral fox. Because the horse had evidence of bite wounds on its hocks, Fahad feared that a fox so brazen as to enter the perimeter of the horse's tether might have been rabid. He thus concluded to observe his horse carefully for the next week.

Sure enough, within a few days the horse was stumbling and behaving erratically; but most importantly, it was also refusing to eat or drink. With the help of a friend he got the animal down, and with its forelegs and its hindlegs securely tied together, Fahad made a desperate effort to rule out any foreign body that might be lodged on the animal's gullet. He found none, but this effort caused the animal to thrash about, and during one swing of the horse's head, the animal's incisors laid open Fahad's scalp. The animal died (choking to death) within the hour, by Fahad's description.

With the help of his friend, Fahad decapitated the animal, loaded the horse's head into his pick-up truck, and started the 150-kilometer desert trip to the hospital/health center in Dhahran. I was awakened and called to the emergency room to attend this man and told: "And please, take care of this horse's head!" To conclude the narrative based on Fahad's story, I hastily started Fahad on a course of rabies antiserum, while the pathologist and I--gowned up, doubly masked and doubly gloved--began the impossible task of opening the dense horse skull using a Stryker Cast Cutter and all kinds of adjunctive tools (ruining several!) to get that brain out intact.

Finally succeeding, I placed that equine brain in a canister of liquid nitrogen; then through the personnel office, learned that there was an Aramco employee whom Aramco was sending to the States on a business assignment that day. I then cabled CDC (Centers for Disease Control) in Atlanta to please have somebody meet that plane at Kennedy and help our horse brain courier get through customs, and for CDC to please carry on from there with the lab work to determine whether the horse had been truly rabid or not.

The old fashioned name for rabies is "hydrophobia." But the symptoms are not fear of water but spasms of choking when swallowing anything, even their own saliva, thus drooling from the mouth and refusing to eat is a pathognomonic symptom.

Within hours I had a response cable that they, even though they were our highest authority in USA disease control, would not be able to clear that specimen through U.S. Customs. However, someone from CDC would meet the flight, and would see to getting it trans-shipped to the Pasteur Institute in Paris for us. I was worried lest the same situation would occur in Europe, but it was accepted by the Pasteur Institute; and within thirty-six hours we had a reply something like this (forgive my French): "*Le cerveau du cheval a immuno-fluorescence positif le rage*"--thus confirming our worst fears. Of course, we had already started a course of rabies antiserum injections into Fahad; thus we continued the full course. Fahad remained well despite a tooth-inflicted, saliva-contaminated scalp laceration by an animal dying of rabies.

Indeed, albeit living 150 kilometers away, he maintained contact from time to time, and years later when I was in the final preparation of retiring from Aramco and departing Arabia, I received a very nice phone call from Fahad, saying, albeit in Arabic, "Greetings Doctor Oertley. I am Fahad

Matlaq--'horse bite!' And I want to thank you again for your treatment, and pray that Allah (God) watch over you and your family as you leave our country and return to your own."

[End of inserted material]

Hicke: Okay, that's the story of Fahad Matlaq. But there's a bit of a sequel.

P. Oertley: Fahad showed up at Bob's office in the clinic one day carrying a bag of *fúgah*. That's the name of this thing that appears in the desert in the rainy season, in the soil, which is very similar to a truffle. They're considered delicacies. So he had a huge bag of them, and we didn't know what to do with them. They're quite sandy. I asked around, found out; we ate them and they were delicious.

Oertley: They really were.

Hicke: Did you ever see any again?

Oertley: No. I didn't.

P. Oertley: I don't remember.

Hicke: *Fúgah* is kind of like fungi, isn't it?

P. Oertley: Yes.

Oertley: It is.

Hicke: They're mushrooms?

Oertley: I've never thought about it that way. I'm going to look it up in the Arabic dictionary just to see how it's spelled.

Hicke: Tell me how you found out what to do with it.

P. Oertley: I asked all my friends and somebody knew, probably someone who'd been there long enough and who had people do the same thing to them that Fahad did to us, which was simply presenting us with this little treasure.

Hicke: But you never saw it in the market?

P. Oertley: No, no. They weren't in the market; probably they were scarce and maybe too hard to collect; and if you did collect them, you'd bring them as a gift or eat them.

Oertley: Probably a very narrow season, also, when you consider their hot desert out there, they have a kind of a rainy season, briefly. And it isn't everywhere and it isn't every year.

Epidemiology

Hicke: One thing we haven't much discussed was that you were, as you said off-tape, starting to get more and more knowledgeable about epidemiology. Tell me how that evolved.

Oertley: When there is in an area an unexplainable high incidence of a particular illness--whether it's malaria or food poisoning from people harvesting fungi offseason or whatever--this is considered a kind of epidemic for which there must be some way to reverse the epidemic. Some epidemics, it's difficult. An epidemic of smallpox is fairly easy if you can get to the unexposed and vaccinate them before it gets to them. That's what epidemiology is. Well, just stepping on a nail: you give the guy a shot of tetanus; the same program is being enacted. With malaria, you move out and destroy the mosquito breeding ponds, cover them with oil or something of this sort so that they can't breed. A mosquito doesn't have malaria *de novo*; it gets its malaria by biting a person who has malaria. It gets its organism and then bites somebody else.

Hicke: Did you have to deal with malaria?

Oertley: Yes, we had two varieties there.

Hicke: Oh yes, I think you mentioned that.

Oertley: They were both in Arabia, and the thing is, you can't do much about immunizing the people against malaria. You couldn't then, at any rate. I think now there's--well, I don't even want to talk about it because I'm not sure; they are coming up with other things you can do. But there, you either have to get rid of the mosquito--and of course, that's a matter of finding out where they're breeding and pouring oil on the surfaces, kerosene, that sort of thing. This is done in all of the underdeveloped countries of the world where people are always going around looking for larvae of mosquitoes. The potential for malaria is there, particularly if even some transient person goes through in an incubating stage with malaria, now the mosquitoes have it, and now it can spread. The mosquitoes don't have malaria.

- Hicke: Yes, they carry it. So it sounds to me like you were not only treating patients, but you were going much further and trying to eliminate or contain the disease.
- Oertley: That's what epidemiology is. Epidemiology is trying to anticipate, prevent, what can happen. For instance, rabies had never been reported in Arabia before. And I didn't know that it was there. So we had doubts when we were sending this brain off. Well, although he's got this scalp laceration and it's saliva-contaminated from the horse; when you get a dog bite from a rabid dog, if it's been saliva-contaminated, now this person's infected. Nobody lives with rabies.
- Hicke: So did you go back and try to do something about the rabies that you found?
- Oertley: Well, definitely, we announced to the minister of health that there is rabies on the northern frontier, and that was out of our bailiwick. He had come three hundred kilometers to Aramco--with his perspicacity, let's put it.
- Hicke: He was a Tapline employee?
- Oertley: A Tapline employee.
- Hicke: So you didn't have to do anything about it because--
- Oertley: Oh, no, no, no, we took care of Tapline. I was also later on even medical director at Tapline from Dhahran. I didn't have to go up to Tapline to do that.
- Hicke: So you supervised--
- Oertley: So I went up and visited their clinics along the line periodically and discussed problems. They were small clinics. They had probably four or five doctors and a dozen nurses in each one of these.
- Hicke: Were they established at the same time that the pipeline was being built?
- Oertley: No. Well, yes, but they didn't become really sophisticated until later on. They were sort of quick walk-in clinics and it was meant for the people who were doing the work on the line, and that was about it.
- P. Oertley: Like an emergency room.
- Oertley: Exactly, like an emergency room.

Hicke: Oh yes.

P. Oertley: But then they had beds. They were like little hospitals, really.

Oertley: They ultimately had an eight- to ten-bed hospital complex. Tapline was a rarefied atmosphere. You don't see anything for three hundred kilometers, except the pipeline, while you're driving along the desert; and then suddenly there's this station that is only there because Aramco needed a pump station at that point where part of the oil is taken out and serves as fuel for the pump, and then that drives the rest of it through. It's like the heart.

P. Oertley: Mainly towards the end there, they did a lot of deliveries, wasn't that it?

Oertley: Oh yes.

Hicke: Babies, you're talking about?

P. Oertley: Yes.

Oertley: That's because when that station developed, there was also water. They drilled for water, so there was a well, a water source for the people that manned the station. And this caused then migratory Arabs to make sure they headed toward this spot on their migration north and south annually with their flocks. So then, as always in Arabia, those non-company related families of Arabs began to colonize around these places because there was water. Grocery stores evolved for the company employees and then they expanded out. A local entrepreneur would set up one also. These became towns.

P. Oertley: It was understood that you gave treatment to anyone who came in.

Oertley: Exactly. You didn't refuse treatment to anybody.

P. Oertley: So, that could be Bedouin.

Oertley: But you can understand how could you refuse treatment, in an environment like that? Management wasn't going to in any way offend the native community by refusing to care for anybody.

Hicke: Maybe nobody knows, but do you suppose those little communities are still there even after Tapline closed?

Oertley: Oh yes, actually.

- P. Oertley: Tapline is closed down, but they can start it up whenever need be.
- Hicke: It's still potentially operational, as I understand it.
- P. Oertley: There's a word for it, like mothballing.
- Hicke: Yes.
- P. Oertley: They're mothballed.
- Oertley: And wells are still there. The pipeline is still carrying oil.
- P. Oertley: One of the stations, Quaisuma, was reopened and it was made-- Frank [Jungers] would know all this--it was made large and is large. They even have a school going there again. But I don't know why.
- Oertley: Yes, I don't know why either now.
- P. Oertley: It's bigger now than it ever was.
- Hicke: So getting back to what you were doing, that was one of the things you did: supervise these clinics. Did you have any particular incidents or challenges that you recall? Traveling?
- P. Oertley: What about the airplane? [laughter]
- Hicke: You had to fly on the airplane?
- P. Oertley: Always. That's the way they got up and down the line.
- Hicke: Yes, you said it was three hundred kilometers.
- Oertley: There wasn't a paved road; it was sand. And three hundred kilometers, even in a Land Rover--[pause]
- Hicke: Okay, well let's get back to Abqaiq.
- Oertley: When we got moved to Abqaiq, it evolved that a lot of our patients who were Aramco employees lived in Hofuf, which was fifty, sixty kilometers south--again, on a sandy road. Some of the people who lived in Hofuf worked for the company very definitely; and they traversed this distance. In fact, the company even had a bus that went down, picked them up, and took them back. Then they would stay in temporary housing for the week and on the weekend go home. The weekend, of course,

is different from Saturday-Sunday. It was Thursday-Friday. Because Friday was mosque day.

Hicke: So they wanted medical treatment closer to home for their families as well as themselves.

Oertley: Yes. And Aramco responded favorably. I went to the weekly meeting in Dhahran--the weekly meeting of managers--and by that time, being medical manager of the thing, I felt the onus was on me to at least express this. I felt Aramco would respond favorably. What we had done, we had started to send a little team of Arabic-speaking doctors and nurses down, and sort of rotating them into a less-than-adequate environment. It was in an old kind of a school building that was masonry but it lacked some things. We couldn't do deliveries there and that's one of the things that you really needed to do. For the Saudi, with many children, a proper delivery room was necessary.

Aramco management quickly accepted this. They asked: "Well, how big do you have to have it?" and "Do you have to have your own well?" We did our own research on that aspect of it, because I had that preventive medicine--we had people there who could do those things.

Hicke: Did you have to sink a well?

Oertley: I don't remember whether we did. But since it was an Aramco building with Aramco manpower within, they must have drilled a well.

Hicke: It wasn't part of your work; I guess you had somebody who dealt with that.

Oertley: I think ultimately Aramco probably made that decision itself: If we're going to do it, we're going to put in our own water, et cetera. That's usually the way they did things, not to depend on whatever the city water is or anything of that sort. But then it would be our fault if we didn't take full care. So that would have been a simple matter for Aramco: they drilled wells all over the place anyway. Not only oil wells, but water wells. That's a good question. I'm not absolutely certain, but I'm sure that we had our own source.

Hicke: What did you build? Did you build it?

P. Oertley: Ultimately. But at first you--

- Oertley: Yes, we used an existing facility there for at least a couple of years; and that's the one I remember.
- P. Oertley: You redid that, and that was sort of revolutionary, because no one had retrofitted another building for a clinic in Aramco's history or the local history either.
- Hicke: So it was sort of flying by the seat of your pants, I guess?
- Oertley: Yes.
- P. Oertley: You had input from--
- Oertley: From Haynes, Lundberg & Waehler in New York.
- P. Oertley: Architectural firm in New York.
- Oertley: Yes. They had already been out with Aramco on other building projects, office buildings and so forth that they were doing.
- P. Oertley: And then later when you really built the clinic rather than just rebuilding the other, they did that too. So they rebuilt the building for a clinic.
- Hicke: So you had to order more equipment and outfit this clinic?
- Oertley: Yes, well, the equipment was an easy thing, because replacement equipment, you know, we could even do that by saying, This thing is still good, but we could use it down there until a replacement examining table can be shipped from the states.
- Hicke: Oh, I see: you shifted it.
- Oertley: Yes, to where we needed service more, and then we could get a new one for here like any situation. It didn't turn out to be second class down there; it turned out--once we got the ball rolling--there was a very nice clinic established in Hofuf. We had no Americans on the staff down there, because it required Arabic-speaking persons; and it was just a matter of going down once a week, seeing how things were going. It was only fifty kilometers, sixty kilometers down there from Abqaiq--about thirty-five or forty miles.

It became totally as active as each of the other three-- Abqaiq, Ras Tanura, and Dhahran--the outpatient clinic part of it. Moreover, we had probably more deliveries down there than the others, because this became a situation where we weren't quite sure of the identity of some of the women who came in.

You don't see the whole family at any one point, and somebody could bring in his brother's wife who's having a baby. We didn't do fingerprints or anything of this sort. We just sort of knew that this could happen down there and nobody worried about it. Again, Aramco didn't expect us to deny service to anyone. For example of that, along Tapline, the medical clinics denied no one for service. And these clinics were along the north border of Arabia, and even Iraqi patients were often treated at Tapline clinics. Always, car accident victims of whatever origin were always cared for.

Record-Keeping Procedures

Hicke: Well, it brings up another question: what kind of record-keeping procedures did you have in all these clinics?

Oertley: Oh, they were excellent records. A record was established for each patient and their lineage of children as they were born: the mother and the employee, who would be named. He could of course have four wives, but they were Wife Number One or Two or Three or Four. And if he divorced one, then you had a little confusion for a little while. We didn't worry a lot about that except for the fact that you needed to know whether this was that patient or not.

Hicke: Sure.

Oertley: I mean, it wasn't a matter of denying them care; it was a matter of: "Is this the same one that we saw for schistosomiasis just a year ago?" It was a matter of getting the identities as correctly as you could for continuity of individual medical histories.

One funny story, I have it in here incidentally. You can take this [gives paper]. I made it for you, anyway. The Saudis began to be birth control conscious. They sort of recognized that they could never be as wealthy as they'd like to be if they kept on having kids, because it was sort of a gradual growth of awareness. At one point it was pride in having a retinue. But now, when more modern things are available, how do you provide for all of the families--all the children.

Hicke: Difficult.

Oertley: So birth control became important, and they got around to wanting not just medication but a diaphragm. A woman was in the clinic, and the gynecologist who was fitting her for her diaphragm was called to a woman with a bleeding uterus or something, away from this process. And you know what an ugly instrument the vaginal speculum is. You've seen them, I'm sure, not just felt them--this alligator jaw thing, which holds the walls of the vagina open for visualization of the uterine cervix (mouth of the womb).

The gynecologist was called away and the nurse had come by, and was busy in this little clinic. She asked the patient if the doctor had seen her and didn't bother to check anywhere else while he was away taking care of a bleeding patient in the emergency room, I don't know what. At any rate, she was told to dress and that she could go. And of course, there's no billing or anything, so they go. There's no final checkout except there's a note put in the chart; that's the end of it. Her husband brought her back to the clinic that night. He was irate.

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Oertley: Literally in a rage, he said, "I don't care how effective this instrument of the devil is, but get it out! By all means, get that thing out of there!" And the thing was, with the vaginal speculum, once you screw this little thing open, it stays open. You can't pull it out. He didn't know where to release it. Of course, she's waddling all the way like this when she's coming in! [laughter]

Hicke: Oh, heavens!

Oertley: I didn't see it, but the story spread through the whole medical group the next day. All four stations knew about it, and everybody was chagrined but laughing.

Hicke: Yes, that's a great story.

Nursing Staff

Hicke: I'd been meaning to ask you: what about nursing help? What did you have in the way of nurses in these village clinics?

Oertley: We had nurses that were trained in Lebanon, particularly because of the language. We really needed that sort of thing

for the management of patients. We had American nurses of course, not a lot of them, but it became essential. I mean it was essential from the word go. We were searching for nurses who were trained in Lebanon, who were Arabic-speaking. They were all of good quality. They were trained at American University of Beirut.

Hicke: Was there a big turnover?

Oertley: No, I think they were pretty stable.

P. Oertley: The wages were good for them. They had more of an opportunity, I think, in Arabia than they did elsewhere.

Oertley: They had opportunities for further training. Aramco was very generous with giving employees an opportunity: "Oh, you'd like to advance and go into this," and they'd ship them off, let them go to--what was the place in Egypt? A lot of them trained there, but I can't think of the name.

P. Oertley: I can't either. I remember towards the end of your stay there, you had some Irish nurses--English and Irish nurses. The company was hiring a lot of English people. One of your Irish nurses was at the Hofuf clinic. She was the one that was bitten by the spider that was like a brown recluse. It has a horrible bite, which I saw pictures of.

Hicke: She lived through that, I guess?

Oertley: Oh yes.

Hicke: Uncomfortably, obviously.

Oertley: Well, it caused an increasingly large necrotic¹ area. It just killed the tissue there; it all had to regrow and there was a big scar and all that sort of thing, you know.

P. Oertley: That's why I remembered he had Irish nurses. [laughter]

Hicke: Well, whatever works. You lived in Dhahran, eventually, right?

Oertley: Yes.

¹Necrosis means death of affected tissue.

Moving to Dhahran

- Hicke: How did it happen that you moved from Hofuf to Dhahran?
- Oertley: I never lived in Hofuf. I worked out of Abqaiq down in Hofuf. I would go back and forth, but we didn't live in Hofuf.
- Hicke: Okay. But then eventually you moved from Abqaiq to Dhahran.
- Oertley: We did move to Dhahran.
- P. Oertley: You only lived in Abqaiq for a year and a half. I lived there three years. This is the story I like to tell, because he was transferred; but a lot of people were being transferred into Dhahran. Housing was at a premium, and there were certain requirements for certain kinds of houses. If you had this length of service with the company, you had adequate housing points, this many children, and all of that. So you waited your turn in a situation like that, unless you wanted to go into housing that you weren't really happy with.

So there we were, waiting. It took a year and a half. He'd commute back and forth from Dhahran where he was now working and living in Steinecke Hall, which was where they put people in his situation, and also guests of the company. He lived there; it's sort of like a little motel without the parking places. So he went back and forth on weekends, and-- tell the story about this Easter weekend.

- Oertley: This was funny because it relates to Easter. In Abqaiq one morning--I was in the church choir that we had--it was the Easter Sunday weekend for the rest of the world. Of course, as far as Aramco went, they didn't observe Easter as a holiday per se. Friday was church day.¹ That was no work as far as regular work; the offices didn't open. Things that had to be done were done, but the routine work could be set aside for a weekend acknowledging the Saudi holy day, Friday, mosque day.

So it was Easter Friday--Good Friday, it was a holiday. The services were held in the hall--the cafeteria or recreational building that we had in each district. You didn't have a church. But that was where we had plays and so forth; it had an auditorium, it had almost a basketball court

¹Friday is Mosque Day in the Muslim world, so we as Christians observed our weekly religious services on Friday. Sunday was the second day of the work week.

kind of thing. So church services were held. We had pastors, probably one in each district, and then they'd rotate if they were Catholic or Protestant.

I was in the choir and we had an Easter anthem. Pat and I lived right across the street from the District's Great Hall--this community gathering spot, across the corner from our Aramco house. Pat hadn't gone to this service. I was heading out to go to Dhahran for that day as I had been doing for the last week for a particular reason: covering for someone, I don't remember who. I called a company taxi to be waiting for me. He was coming, I think it was every Friday, he came out.

But at any rate, I finished the anthem and dashed out to get the taxi. Oh no! Before I had done that, I had to call a patrol taxi to tell them to come, but don't expect me to be right on time because I'll try to be out there at such and such a time. But don't honk your horn; I remember telling him that.

But at any rate--[chuckles]--I came out of the common building, our recreation hall, where we held the church services, because we didn't build Christian churches in the Kingdom. (We weren't permitted to build Christian edifices in Arabia, the home of Islam's two holiest holy cities, Mecca and Medina). I went to the taxi and I approached him from this side, of course, because he's sort of watching the house and I'm coming from the opposite side of the street. I tapped on that window. "Ah, doctor!" he says. So then he lets me in and we start off; it's a routine trip that I've been doing to Dhahran for the last month for some reason, I don't remember why at this point in time.

I was aware, as we were driving along, he kept massaging the steering wheel, holding it in one hand. He was agitated about something and I couldn't figure out what it was, but I didn't worry. Finally, he asked me: "Why were you not at home today?" You know, he had a feeling that I had been out, coming from somebody else's house. [laughter] I could never have explained it satisfactorily that I was singing in an Easter, (thus Christian) choir service and my wife was still in bed. Oh, first he asked me why I didn't want him to blow the horn. "Well, I didn't want you to wake up my wife," I said. Now this man [laughter] went, "Aaahhh," with a knowing nod and a bit of a sly grin. And since he'd been watching for me to emerge from our house, he'd not seen me emerge from the public building across the street.

So then he keeps massaging the steering wheel as he's going along, and he has more questions but he doesn't know how to phrase them. Finally [laughter] he gave a sort of knowing wink and dropped the subject. I'm sure he firmly concluded that I'd been philandering--and worse, probably spread his tale among fellow taxi drivers. Who knows--maybe they even watched our neighborhood to determine where the other party lived. If so, they wasted a lot of time.

P. Oertley: Isn't that great?

Hicke: That's a great story!

P. Oertley: People are the same all over. [pause]

Field Director, Trachoma Research Program

Hicke: You were just talking off-tape about the things that happened on these village visits.

Oertley: Yes, these trachoma field trips. People responded surprisingly well, mostly because it was sort of like the circus coming to town. We spread our stuff out, all the gear --there wasn't much, but vials and bottles and things. We'd collect specimens. We had this one instance that Dottie mentions [in her oral history], Dottie McComb, regarding the singing. I'd forgotten the "Three Blind Mice." It was a way of getting them all kind of involved in a fun thing, actually singing in rounds. We would do it in rounds among us and get them to go with us. It wasn't pronounced correctly, but it was close, and it was kind of fun; they really got a kick out of it. I was surprised, because we had nothing from our experience with them to enable us to realize that they might like to join in something like that.

Now, they did like music and they did like particular kinds of folk dancing that they'd do. But this didn't involve that: this was singing a song that made no sense to them. But it wasn't that hard to sort of mimic the song; it came out distorted but fine.

Hicke: And you were saying that the villagers really didn't give you a hard time, although you were inflicting some discomfort.

- Oertley: Oh, yes. Exactly. Definitely. It was amazing to me. Roger had the program well established before I ever reached Arabia. Roger Nichols.
- Hicke: You are referring to the trachoma project.
- Oertley: He was doing this with the Harvard School of Public Health. He was an Aramcon, but he--. Have you seen his book, by chance? You know he put together a book on trachoma.
- Hicke: Elinor [Nichols] sent me some excerpts from it and also she told me about his part.
- Oertley: Okay, good. I have a copy upstairs, but it's not something that even I want to read through. Technically, it's all that you ever wanted to know about trachoma at that state of the art.
- Hicke: So he just got you involved as soon as you got there?
- Oertley: No. He would plan these sorties on weekends; and he needed me for extra help and because I was an M.D.; this was something that wouldn't take long to impress on me what things could be done without a lot of extra explanation. So I went out with him and enjoyed it very much.
- P. Oertley: And the way you actually got involved was he had decided to go back--
- Oertley: That's true.
- P. Oertley: --and take the head of the department of biology whatever at Harvard--
- Oertley: Microbiology.
- P. Oertley: --and he asked you if you would take the program over.
- Oertley: It was a matter of only continuing what he was doing, following up in the various villages, scraping the underside of the upper lid of people, looking for the organism and comparing that to their lifestyle and what they were doing. He did determine that the trachoma organism was harbored in the vagina of the women, and the kids were infected at birth. Sliding through the birth canal would inoculate the child's conjunctivae, the lid. It wasn't a matter of direct acquisition. It was probably extended by the use of kohl--
- Hicke: Oh, yes. Eye shadow.

Oertley: Eye shadow. Because now they would use the same instrument to apply this on this person and that one. A little more here and, you know.

Hicke: So you continued that, then.

Oertley: I continued it for a time, not for very long. He had some villages he still wanted to have followed up, but he left. And Dottie was there also, so she was really the one who held it together, because I was continuing with my work with Aramco; and this wasn't Aramco work per se. It was approved by Aramco for Roger to do this.

P. Oertley: They funded it. I also think that they did a lot of things like that, altruistic things as we all do, because they got credit. It sounded very good.

Hicke: With the Saudi government?

Oertley: Yes, definitely. We're doing something else besides taking oil. It provided employment to a lot of Saudis, the oil company. The Saudis didn't lose by us being there. Indeed wherever we traveled in our four-wheel-drive vehicles, exploring the desert, the Bedouins we encountered in their tents were always friendly and happy that we stopped to visit with them. Not only were there no road signs, there were no consistently defined roads; they truly were tracks in the sand, and they would disappear in wind storms.

Director of Preventive Medicine

Hicke: I wanted to ask you about moving to Dhahran now. You must have moved because you changed jobs or were promoted.

Oertley: Yes, I guess that was it.

P. Oertley: You went from being head of what was going on in Abqaiq and also working on trachoma. You went into Dhahran when they were expanding in every way because this was the beginning of the seventies. The Medical Department was expanding, and you were at that point going to head up a unit that they had never had. They hadn't called it that before: it was the Epidemiology Unit.

Hicke: They just formed a new department?

P. Oertley: Yes, everything was expanding. And because of the workload of this, that, and the other, they were separating things. That was it. And you were also doing ambulatory medicine. I remember you had two or three jobs, and the one you liked the most was epidemiology.

Oertley: Well, epidemiology was thrown in by virtue of the fact that we had malaria, two varieties; we had schistosomiasis there among the Saudis. And these things were endemic, endemic meaning they were there for a long time and just--

Hicke: Permanent.

Oertley: Yes, exactly. I would go to management when we would need some additional people for various kinds of operations that we were undertaking. Aramco was very, very compliant in this respect. They recognized that the Medical Department was their--

P. Oertley: P.R.

Oertley: Yes, a public relations thing, and also a real asset to the communities there. The government knew it. This was an altruistic involvement. I would have expected that the people who were searching, drilling, producing, refining, and shipping oil would have been hard pressed to see the need for the expense of what we were doing, but they were most responsive.

P. Oertley: Well, you proved it to them. I remember when you could show them charts of the decrease in clinic visits as a result of education programs for the women, the babies, that sort of stuff, and the malaria.

Oertley: They did respond and they did understand; and they also knew that to maintain goodwill in the Kingdom, this was enhancing that process, because the Saudis could have said, "Well, you're draining off a lot of oil from us--all those barrels and barrels." But they knew they were getting a benefit that had no relation to the oil production. And we reported to them. I'd sit in, in my role in preventive medicine--I actually hired a Preventive Medicine director--at their weekly meetings. Just sit in, number one, to listen to what's going on, what are they doing here, what's the prospect of some clinical problem out in here--just this listening, hoping to anticipate a problem or presenting a request: "We really feel we have to do thus and so."

Hicke: These are management meetings?

- Oertley: Yes. That's a management meeting. They were always responsive and more compliant than I expected them to be. They were interested in the area and its people, and anything that enhanced goodwill. I make it sound like it's commercial, but it's not, really. I think they had a real feel for the people; I think those were people out there for a while who really liked the Arabs.
- Hicke: So you attribute this to--
- Oertley: --humanity I think as much as anything.
- Hicke: But it sounds as if the early managers formed some sort of corporate culture that was passed down. Is that right?
- Oertley: I don't really know.
- P. Oertley: I'll look into that. I think that's the way it was.
- Oertley: Yes, I do too. I came in late, and as far as I'm concerned, that attitude was not just prevalent, but evident. And the very fact that I began to attend the weekly management meeting--although I had nothing to do with oil, nothing to do with its processing or transport or anything--I'd sit in and listen; and then I'd occasionally tell the manager about the little report or request I'd like to put in before this meeting's over. It developed to the point where finally they'd say, Okay, doc, you got anything for us today? you know. It was always in good humor. There was no feeling of, Oh, okay, now what are you going to lay on us? It wasn't that kind of thing. Oh, they did that sometimes as a joke.
- Hicke: You reported to Industrial Relations, is that right? How did that work?
- P. Oertley: It changed. It changed at various times: for instance, in Ras Tanura and in Abqaiq, you reported to the district manager.
- Oertley: Yes, that's where I was.
- P. Oertley: He was the head of the whole thing.
- Hicke: This is not a medical person, this is the company district manager?
- P. Oertley: Yes. Then when you got to Dhahran, it was levels and levels and levels. The person in that case, you reported to the equivalent of Bill Taylor, who then reported to--

Hicke: The medical director?

P. Oertley: Yes. He was Bill's medical director, who then reported to Industrial Relations.

Oertley: But in each district, in Ras Tanura, I ended up going to that district management meeting. Dhahran meetings, as I can recall, they were all managers.

Hicke: Are we talking about the medical clinic now or are you talking about the whole company?

Oertley: I'm talking about Aramco and this matter of reporting to them. There was an openness. You could go in and present anything. There was a meeting, I think it was on Sunday, Friday being mosque day, as I've said. My attendance started when I felt that we in medicine had something currently significant that management needed to know regarding health affairs, whether it was limited to the American community or some health problem involving the wider area, and especially in those instances where I'd travel to Riyadh (Riyadh is the capital city) to discuss a health problem with the Minister of Health. I began to attend, and I learned what they were talking about by first having something to present; and then thereafter, I would go and give a followup on whatever we had done. "You remember the program that we started on such and such? Well here's what's happening. And I think we'll see that it was a worthwhile effort."

Then it was a matter of somebody saying at a party, "Hey, you haven't been to a meeting lately." "Well, I haven't had anything to present," I say. "Well, you used to come and at least listen to what we were doing," they'd reply. I said, "Well, okay, I'll be in next week." Then I'd go for a few weeks again. But it would happen always that something would interrupt again for a little bit. I didn't make a regular report at the weekly meeting by any means, but neither did every other manager. They'd go around the table: "Anything from you in this area?" Nobody ever frowned on Medical's appearance in there. I think they knew the Arabs appreciated our being there. They recognized a difference in their health, all of those who had association with the company. And more than that, we began really to interact with the Ministry of Health and going in to Riyadh or at least as far as Dammam. That was where I'd see Dr. Shishakli.

Hicke: It was the local seat of government?

- Oertley: Yes, Dammam was the governmental center for the Eastern Province. [pause]
- Hicke: You were just talking about how you sort of evolved into preventive medicine by going back to the States--
- Oertley: --and realizing that there were things that we could do to even reduce our workload, which was economically justified.
- P. Oertley: And taking workshops and seminars at CDC (the Center for Disease Control in Atlanta). They had these things to educate people from countries where they'll have the opportunity--
- [Interview 2: August 19, 1996]##
- Oertley: --to stop at CDC whenever I was back in the States to discuss with somebody a particular problem, and on occasion, bring one or another of them out to Arabia at Aramco expense. Having them come out and be on site helped immensely in more rapidly developing a solution for any particular problem. Aramco management was truly never stingy about this. In fact, I'd make a point of always reporting back to them what results had emerged, because I felt that would improve my chances the next time I needed that kind of help. [pause]
- Hicke: You were just saying you went out as a GP.
- Oertley: Yes, general practitioner, delivering babies, setting bones-- the various things that you do there. All of this, the necessity for doing more than treating those who get to you meant to go out and look for sources where this was evolving and stem it way back. It turns out that it saves more time, saves people from illness, saves money in the long run.

But management, I felt, was always very responsive in Aramco. They knew we were guests in this foreign country and we were benefiting, and we were also helping Saudis to become affluent. Keeping them healthy was part of the game; it improved the relations between the two countries, the working components from each. It was never a problem. I always felt warmly toward management in that regard; they listened and they responded. Oh, sometimes they teased: "Oh, Oertley. What are you going to ask for today?" This kind of thing. But I was always happy when I could say, "No, I'm going to report the good news about what we did last month." [pause]

Camel Trip into the Desert

Hicke: Tell me about your trip out into the desert with Mohammad.

Oertley: Okay. Mohammad Said al Ali was a graduate of the University of Ohio or Ohio University, I don't know which it was, but a native of Arabia. He was in the hierarchy of the company; I don't remember what he did, really.

P. Oertley: Industrial Relations.

Oertley: Thank you. At any rate, he and a dentist helped me back--

P. Oertley: Carl Koenig, an American dentist in the Medical Department.

Oertley: Yes, Carl Koenig. We talked together one time at some social event about the fact that we'd all like to take a camel trip. Mohammad would say, "You haven't ever ridden a camel, either." So we took our Land Rover and went out into the desert, the three of us, equipped with gear for camping for a few days, including three five-gallon jerry cans of drinking water. We went to an Arab camp and asked if they knew anyone we could hire to make a short, few days' trip on the desert. It turned out that we did get a referral. This fellow, though, had to find someone who would now rent us the camels; he didn't have any. We ultimately got ourselves going and we had brought a lot of water with us--jerry cans of water in our Land Rover--but now we had to carry this on a camel's back, and some of the camels were a little reluctant to have all that weight. You can find water in the desert, but we were not about to go quite the hard way.

This was ultimately accomplished and we started off. We did get a man to serve as guide. It was actually the first man we ran into; he found the camels for us. Then he said, "Where do you want to go?" "Well, anyplace. Just take us where you'd like to take us," we said. And this left him sort of puzzled. As we proceeded, though, he began to commiserate to Ali Mohammad. He was singing a kind of sad song, and Mohammad recognized that this was kind of weird. He asked him: "Why are you singing that?" "Well, I don't know what we're going to do if I run into some other nomads. They're going to wonder what I'm doing," he said. This was unconventional; he didn't put it in those obvious words.

Now he began to really feel the onus on him; he wasn't concerned about our safety or anything, but now he was concerned about his image with this group of people. We had

no purpose; we weren't going any particular place--we had no destination. He had a way of even massaging the rope. You don't use a bridle to drive a camel. It's just a halter kind of thing, one rope and it's in your hands; you direct the camel with a bamboo switch. When you want him to turn left, you swish the bamboo by his right ear, and the camel would turn to the left. Sometimes if he didn't want to go, he just turned his head and continued straight ahead. And then you sort of whack him on the neck. These things we learned and had a good time with.

The foregoing dissertation on direction control is important to this little event, because one night it rained. It rained hard. Even the desert doesn't soak up the water fast. The low spots become ponds suddenly, and it takes a few days for it to soak in and/or evaporate. It depends on the permeability of underlying strata. Suddenly, as we were proceeding after this rainy night, we saw this water ahead on the desert. Our guide Fahad was veering off to the right. My friend the dentist, Carl Koenig, followed. But I thought, Oh, I don't want to. This camel wants to go to the water. And indeed, he hadn't drunk since we left. I ended letting him go his way, without exerting any control.

Now our Arab guide that we had hired started yelling at me: "No, no, no! Left! Left! *Tahena!* Come this way." At any rate, I thought, Well, I'm going to let this camel drink. I'm not about to deny him water. But our guide knew very well what he was talking about, because the camel, when he realized that I wasn't going to redirect him, went straight to the water's edge, but proceeded into the water deeper and deeper. I thought, Well, you don't have to get in this deep to drink.

By this time the guide Mohammad had jumped off his camel and came running toward me through the water. The camel was down on his front knees--that's the way they get down. They go down front first and then the back, and you almost fall off both ways. At that time I realized, He's not interested in drinking. And at this point, he starts to roll over and unload his back and the saddle. Camels saddles aren't like horse saddles; they're made of wood and very crude things. My gear was soaked. At least I had jumped free rather than get mashed under the camel. I was soaked. Mohammad, our hired guide, was chastising me most harshly and soundly, as he dismounted and ran to my aid, as my camel literally rolled completely over in the water with my gear lashed to his back.

Our guide expertly got my camel on his feet again, and then he laughed uproariously about this dumb American who

couldn't control his camel. I'm glad it happened, because ever after, when I took my kids out on the desert and we would stop well out in front of a Bedu tent to show them a family living in the desert, I would introduce myself as a friend of the guide. I would announce this to the people coming toward the Land Rover, and we parked by established protocol, about thirty to forty yards out in front of the place and made sure that there were men present before we approached the tent and all this kind of thing. In order to break the ice more quickly, I'd just tell them that I rode a camel with Nasir--or whatever his name was, I've forgotten. And they'd respond: "Ah!!" This had gotten all around.

"You're the one! Come on in. Come on in, crazy American who lets his camel get down in the water and roll over with him still aboard." [chuckles]

Hicke: It was well worth it.

Oertley: Oh, it was. It paved the way for many lively desert trips.

Hicke: As they say, you dined out on that for years at dinner parties. [laughter]

P. Oertley: What a nice expression.

Oertley: Enough of that.

IV PAT OERTLEY

Background and Education

Hicke: Now let's talk to Pat for a while, and let's start with when and where you were born.

P. Oertley: I was born in Pensacola, Florida, on October 9, 1927.

Hicke: Did you grow up in Florida? In Pensacola?

P. Oertley: No, in Tampa.

Hicke: In Tampa, okay. Stayed there through grade school?

P. Oertley: Through high school. And then I went to college in South Bend, Indiana at St. Mary's of Notre Dame.

Hicke: How did you pick that?

P. Oertley: Let's see. There was an aunt of one of the nuns at the high school, who came and talked to us. That was the school that she was talking about. I liked it because it sounded far away, so I thought, "Oh, great." So I went and really enjoyed it.

Hicke: You're a professional artist. When did that get started?

P. Oertley: I began lessons in high school, private lessons.

Hicke: Painting?

P. Oertley: Yes. Oil painting.

Hicke: What kinds of things were you doing?

P. Oertley: Just learning, of course. As I recall, we were copying pictures, which is very good training.

Hicke: Masterpieces?

P. Oertley: Anything. We could choose it. I remember the head of a little girl with berries, red cherries I guess they were.

Hicke: Then what did you do when you were in college? What did you major in?

P. Oertley: I majored in art. I had a minor in theology and also in textiles. I really enjoyed going to college--and high school. I loved going to school.

Hicke: What kind of extracurricular activities, high school and college?

P. Oertley: Dating. [laughter]

Hicke: Dances?

P. Oertley: Dancing, yes. You know, typical. I don't remember being in any clubs. It was a small school, for one thing, and there weren't a large number.

Hicke: High school or college?

P. Oertley: College. I don't remember a large number of clubs. It just seemed very full and very satisfying.

Hicke: What was your goal?

P. Oertley: I don't think I ever thought of it. So of course, when I got out: what do you do with art? Then I went and got a master's in art in New York, and really enjoyed that.

Hicke: Where?

P. Oertley: At Columbia [University]. And I think part of the enjoyment of the thing was the fact that I was dating a reporter from the New York Times. He had a lot of entrée into things that I wouldn't have had the chance to attend: he got tickets to art openings, and I remember being in the presence of--not meeting--people like Franz Kline. He did black and white abstractions or nonobjective art. I hadn't been exposed to any of that in college, so it was quite an awakening.

There were others too that were on their way up and now are famous. I went to a lot of events. I remember I went to a prize fight once with him--the only one I've ever been to--and the man's name was Tony Zale, not a well-known name in prize fighting.

Hicke: What years are we in now? When did you graduate?

P. Oertley: I graduated in '49.

Hicke: This is from Notre Dame?

P. Oertley: Yes. And then I got my master's in '50--did it in one year. Then I tried to get a job and couldn't because, you know, what are you prepared for? So my father suggested I go back to school and take education. You can always get a job in education. So I went back to Tampa and I got in another year's work just picking up education courses.

Hicke: Which university?

P. Oertley: University of Tampa, which had a beautiful setting because it's right on the river. It was in the beginning a very large hotel set in Moorish style. That was in the twenties I guess. Like I said, it was just a beautiful setting. Enjoyed that. The courses were sort of uninteresting, but anything can be interesting if you could just sit there and listen. There was some aspect of it that can be worthwhile, but I don't think any of those courses helped me to know how to teach.

So I did that for a year; I picked up all of the necessary requirements, got a certificate.

Hicke: Elementary?

P. Oertley: Yes, and teaching art from kindergarten through twelfth; so I had two certificates.

Early Work Experiences

P. Oertley: The job that I took after that was on Lake Okeechobee in Belle Glade. That was on the edge of Lake Okeechobee. You may not be aware of it, but it's a very commercial area--sugarcane, commercial fishing. It's rural but rural with a difference. They had a lot of immigrant workers. In those days they were white.

Hicke: This is Florida still?

P. Oertley: Yes. So the first year I taught was there. Most of the children didn't have shoes. I remember having to teach a health unit--you know, be sure to brush your teeth every morning. They didn't have toothbrushes. And for Christmas, one little boy gave me a pink towel. He lived where they didn't even have water. That was the first year, which was certainly very interesting. I know I had something like forty-one children.

Then I read an article in *Glamour* magazine about opportunities for teaching outside the United States with the International School Service in Washington. I wrote to them. They made up a file. It was somehow, and I'm not sure how, connected with the U.S. government. I've heard since then it was a CIA kind of thing and that was the opportunity to put people in different countries. Well, nobody ever approached me on being a spy. [laughter] I would've been a good one! Anyway--

Oertley: She would have.

Hicke: Did you have to send in your grades to the CIA?

P. Oertley: You know, it was the usual thing. They built up a file. Then they told me three or four different countries where there were openings. And the one that appealed to me most was Venezuela, because it was Caracas, the big city. I went there the first year. That was a marvelous year because of the fact that I was right in the middle of the city--a lot going on. There were a lot of single people there, all different nationalities. I lived with another teacher from the school in an apartment building which was in a small area right in the city, but it was known for its nightlife so it was exciting to be there.

Hicke: Who were you teaching?

P. Oertley: These were children in a private school. The school was subsidized by the oil companies who were there; so if their employees were there in the city and they wanted to send them to the American school, they did that, with help for the tuition. But at the same time there were also lots of Venezuelan children whose parents, of course, wanted them to be fluent in English. Those little children came to school in chauffeured cars and they wore diamond earrings. So it was a neat mixture.

I got to see a lot of Venezuela. We spent a lot of time on the weekends at the beach, little groups of us. There would be places where there were hammocks and little outhouses. In the morning, the little boys would be waiting at the edge of the water with baskets, covered with wet seaweed and there were raw oysters in there.

Hicke: Nice!

P. Oertley: In those days, you ate raw oysters. Probably shouldn't, but--

Oertley: Well, you're here to tell it.

Hicke: Yes, right.

P. Oertley: The next year I went to Chile. Again, I heard that opening was with International School Service. That was in a copper mine in Chuquicamata. That's in northern Chile, at about 9,500 feet. At that time, it was the second largest open pit copper mine in the world. It was Chile Exploration Company, which was a subsidiary of Anaconda.

That was a very small setting. The children at that school were children of that company only. It was a little company town. It was barren; there were very few trees, because this was the Anaconda desert--rocky. I was there a year and a half. We didn't have any rain that whole time, but we had snow once.

The interesting part of being there: the employees were mostly from Canada, some from the U.S., a few Europeans. There was always a good social life in situations like that. On the weekends, we'd go fishing in the rivers which they had stocked with trout--glorious settings, huge, gorgeous mountains and the Indians, with their flocks of llamas, guanacos, and things of that sort. The little boys hunted with a slingshot; they hunted birds with a slingshot for food. We saw that frequently.

The teaching I did there was mostly combinations of grades. I think I started with the fifth and the sixth. There might be ten children, so it was more like a little family. And of course you did everything. The principal, who'd been there I think since they opened the place, decided I was the one to do the art for the school because of my background. She did the music. So we put on plays; that was a lot of fun. I remember I always made sure that I had the scenery against the back of the piano so she was hidden--and also then she couldn't interfere with my directing. As the

principal, she did tend to want to be the head cheese; but I put her back there with the music. [laughter] It worked out.

Then I came back for a few months. I went to the University of Miami and took some more classes for some reason. I don't remember why. But the University of Miami is a very nice place, and of course it's right in Coral Gables. The setting is, as you would expect in Florida, very tropical, and the beaches were close by. They had apartments instead of dormitories.

And then the next fall I went off to Peru for teaching with the International Petroleum Company, which is a subsidiary of Standard Oil of New Jersey, otherwise known as ESSO. I was there four years. That was a glorious setting because it was right on the Pacific Ocean, at Talara. Talara, Peru is in the northern part of the country. Close to it along the coast, they had whaling stations. They probably don't now, but in those days they did. They had tuna boats, all sorts of things going on. It's a rocky coast filled with sea life; because of the Humboldt Current we get an upswelling of, oh, plankton and all the rest of things that attract the smaller fish, which attract the larger fish, and the birds.

The setting for the company's town was right on the ocean. We were just right there; it was like a resort. So it was a glorious place to be. I walked along the beach a lot. One of the things I remember most was coming across two giant squid.

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P. Oertley: Once while walking along a beach, I came across two giant squid which were maybe three feet long. They were in a shallow tide pool, which is not their natural habitat. So I decided that they needed to be out. It appeared to me that perhaps they were trapped there, because they didn't go away when I came; and I knew they knew I was there because they watched me with their eyes, which are quite large.

So I got behind them. They have a deltoid shape, almost shaped like an arrow, which gave me the opportunity to grab them along the edge of that shape and pull them into the deeper water. I pulled the first one in. Then I pulled the other in. When I got back to the shore and turned around, they were both gone. So it must have enabled them to get back to deeper water, which is where they belong. That was really thrilling.

Hicke: Yes, I can see how it would be.

Joining Aramco

P. Oertley: I'd been there four years. I went into the principal's office. His name was Russ. I asked him to put my file in circulation for a transfer, and preferably the transfer would be to Aruba, an island in the Caribbean which I had visited going back and forth to the U.S. It had gorgeous beaches. He said, "But you're a woman." I reminded him that first of all, I was an employee and all employees had the privilege of requesting that their files be circulated for transfers.

He came back, oh, maybe six and a half weeks later or so, and was surprised. He told me that I was to report to Arabia in September. But I had been to Arabia before, visiting a friend.

Hicke: You visited a friend in Dhahran?

P. Oertley: Yes.

Hicke: So you actually had been to Dhahran?

P. Oertley: Yes, I had been there. As I recall, I even had dinner one night in the company of the principal. I can remember he would ask me if I wanted to work there.

Hicke: Maybe they were laying in wait for you!

P. Oertley: So it's quite possible that the file came through and they said, "We'll take her." Whatever. So I went.

Ras Tanura

P. Oertley: The first place I went was to Ras Tanura, which is right on the beach. I lived in what they called the dorm, but it was a combination dorm/apartment kind of thing with common living quarters--kitchen, living room, and all that--but private bedrooms.

Hicke: Did you actually cook in the dorm?

P. Oertley: Not much. There was a cafeteria. And there were a lot of single people there. The school, at the time, was also right on the beach. Ras Tanura is a beautiful place. The school, I don't remember the size of it, but it was certainly larger than the one in Chile and the one in Venezuela. There was an American principal. Most of the students were American, but there were a lot of Europeans. When I first went there, there weren't any Saudis in the schools, because the schools were founded on an American curriculum for the dependents of foreign workers because there was nowhere else for them to go. Through the years that changed.

In Aramco there were levels of occupations, and those levels had numbers attached to them. There were some numbers higher than others, and those were all executive or what they called senior staff. Anyone from another country was automatically in the senior staff; anyone in senior staff was allowed to live in the community that was built. There were good reasons for that, because in the beginning there was nowhere to live. Everything that evolved was brought in. The local towns evolved, but these were all usually poor structures. They had no schools. They had no medical facilities.

The local people who lived there and worked for the company were trained. They were usually given schooling. Many of them started at the age of fourteen or fifteen. But that's one of the reasons for the company's policy of "the camp." We called it "the camp."

Hicke: Ras Tanura?

P. Oertley: Ras Tanura--the camp being reserved for foreigners. You know, someone looking at it from afar would say, "Oh, those are the Americans, dividing themselves or separating themselves from the from the native population." But it grew up like that. Eventually, it changed, in that as the Saudis became more educated, they attained job levels in that staff level and on up. And at that point, they too moved in--if they wanted to. Frequently they did want to, because the housing was better than what was available to them locally. But later on that changed too, because the company provided the money for the people to build their homes. In the beginning, this was free. They just gave them the money: You build your home; here's the money to do it. That's all sort of beside the point, except that it does explain the school system and the living system.

Hicke: How many children were in your class?

P. Oertley: Oh, they weren't large, maybe twenty. That breakdown would be mostly Americans, with some Europeans and Indians. I forgot them. They were always children of the Indian doctors. Later on--because I taught in three different districts--later on the makeup of the class would be different. There would be probably fewer Americans; certainly some Saudis; maybe Pakistanis; Jordanians, certainly; some Indians; and some Europeans. So that was a nice mixture.

Hicke: When did you go to Arabia?

P. Oertley: I went in '59. At that time, it was a pleasant shock to me to realize that everything I wanted in the way of teaching, or most of it, was there; and anything I needed that wasn't there, I could order it. The money was really no problem--which is not the case in most teaching situations.

Hicke: You had all the supplies you wanted?

P. Oertley: Oh yes--a well-stocked library. In many cases, you had to wait for the supplies to come in. But being right there on the water, and also being close to the desert, that gave everybody--including the children and their parents--the opportunity for learning about the sea, learning about the ocean, learning about what was available in the way of plant life and animal life in the desert. And then of course there's this contact with the Bedouins. Near where we were, the company had provided an area so that we could have a yacht club; that's what everybody did every weekend. We learned a lot about sea life there.

I remember when we first went to the beach in front of where I lived; there were times of the year, in times of the moon's cycle, when you could depend on going out and watching the olive snails do their thing, which was amazing. It was a circle, one right after the other; so obviously it had something to do with mating. They have two antennae; they're siphons, really. Well, no, just one siphon that sticks up, but it looks like two little antennae. That was always up when they were on the surface of the sand; as they went under the sand--and they do that if you approach--everything would disappear except that little siphon.

Hicke: A submarine.

P. Oertley: They had what is known as the Hobby Farm. That was an area in an oasis-type setting where they had horses. Lots of people had their horses there. The children, many of them, learned to ride in that setting. There were very few aspects of life

there that were unpleasant. It got hot, but everything was air-conditioned. And there were company buses--free of course--which took you to the other districts of Dhahran, Abqaiq, and also to the local towns. Life was very agreeable.

Marriage and Move to Abqaiq

P. Oertley: Bob and I met and were married in Beirut in '66. We went there on the company plane. I remember it was a medical seminar that all the doctors were going to. So Bob said, "Well, I'm going to get married. Can Pat go with me?" So that's the way it happened.

Hicke: Oh, great! So it was a business trip?

P. Oertley: Yes, so we got there. That was in '66. By then I had my own apartment so he just moved in. Then we got better housing--a house on the beach. Four months later, he was transferred to Abqaiq, which was sort of like being transferred to Calcutta, you know the hell hole of--. At least that's the way I looked at it from being there on the beach in Ras Tanura.

We went to Abqaiq, which had its own attractions. You were more in the desert.

Hicke: That's south of Dhahran?

Oertley: Southwest.

P. Oertley: It was more in the desert and it was, of the three places, the least desirable place to live. I think Aramco recognized that, and they went out of their way to bend all the rules in every way possible for anybody who lived there. So that was nice. I can't remember anything that we did that would have been bending the rules, but there was an atmosphere about it.

Hicke: You had to stop teaching school, right? You had to quit?

P. Oertley: I had to quit teaching on that basis as a contract employee. I could be rehired the next day as a what they called a casual, but that meant less salary, and they did that, as it was explained to me, because as a contract person we had received extra pay for the fact that we were in a foreign country. We were also included in benefits of the yearly transfer back and forth. Actually, it was two years when I first went, but they changed it later to the annual vacation.

When I married Bob I didn't get a certain amount of money that could have covered their cost of some of those things. And I was on an hourly basis, so the pay was less.

But, shortly after we were married, I remember they wanted me to substitute for the art teacher; all that time I was qualified to teach art, there was never an opening. She went on vacation and I took her job in Ras Tanura doing that. Then Bob was transferred so we went to Abqaiq.

Abqaiq didn't have an art teacher. So that was the first time I had a whole program to myself; and that was kindergarten through ninth, oh, everything. I remember that since the woman before me had really no training, it was just starting from the ground, working a program with the little ones that hopefully would build each year in certain skills that they would learn at one level. Drawing with kindergarten children should be different from drawing with eighth graders; but if the eighth graders don't have any skills, you have to take that into consideration and go backwards.

I started out trying to have all the lower grades established in certain skills and then carry it through. That was a challenge, but again, money was no object. If I wanted to have a program in weaving or a program for clay, I could make out the list and give it to them. They would order it. The only problem was time involved in waiting for it.

Hicke: Plan ahead.

P. Oertley: Plan ahead. That was a lot of fun. Oh, but then, like I told you before, although we were there technically three years, Bob was really only there a year and a half before he was transferred to Dhahran; so he spent most of his time in Dhahran and then he was home on the weekends in Abqaiq. We went out to the desert a lot. That was fun.

The atmosphere of the place was different. For instance, bowling was big, whereas in Ras Tanura people sailed; they golfed. There was more of an academic atmosphere in Ras Tanura because many of the employees were engineers. When I got to Abqaiq, it was obvious from the children that perhaps they didn't do much reading at home. That was because, I felt, the educational backgrounds of some of the parents were shorter than the ones in Ras Tanura. And I mention that because it's an important factor in teaching--very important. You have to know that you can depend on the parents' cooperation and also their understanding of homework and what you do in class.

Hicke: Ras Tanura was a refinery. Abqaiq was an oil--?

P. Oertley: It was the producing part, which meant that you had a lot of people there who went out and worked out on the wells. I'm not quite too sure on the aspects of production, but that's really what they did; they produced. They were the ones that got dirty, more so than the ones in Dhahran. Now, certainly some of them went out far afield and there were technical things that had required a great deal of education, but there were fewer of them there.

Dhahran

P.Oertley: When Bob was transferred, we had to wait out a year and a half for housing to develop in Dhahran. Everybody was on a numbered scale according to the number of children you had, your job points. Housing was available to you according to your housing points. That was a big bone of contention for a lot of women who had left the United States and left a home that they owned, was in a nice neighborhood, and so forth. For some of them, to go over to Arabia and not get the same quality housing that they were used to right off the bat was traumatic. Also, I'm sure, it was exacerbated by the fact that they couldn't work unless they could get one of these jobs in teaching. They didn't even have nursing jobs for the substitutes at the very beginning. Later on they did; but it was only teaching or nursing. They weren't in the offices yet. They came to that later, but mostly they were not in the offices.

Supposing they had been used to working in some field and there was not going to be an opening for them, that was the real blow. They became housewives: they lost status; and then they didn't have their housing, which is also a status feature for many women. I could see that. But I was always different, because I didn't come from a background like that; my adult life was never like that. So, that was really a factor in this business of moving to Dhahran. Because it was the early seventies, the oil embargo had come in; that meant more money into the Kingdom, and they were hiring. They had lots of people coming in. It was a year and a half after Bob was transferred before we got a house; so we moved.

I decided that was a good time to retire from teaching. But there was an opening for the art job. Oh! No, I didn't retire right away, because they wanted me to commute twice a

week back to Abqaiq and do the teaching there. They would just redo their schedules so that I could have all the art classes on Tuesdays and Thursdays. Then they would fit all their other things in around that. I did that for a while, and again, that was sort of fun. You know, they had a taxi go back and forth. When I went, I'd stay overnight and teach everybody in those two days. That was it. They had the days backed so that I could come, stay overnight in their guesthouse, teach the next day, and then go back. I did that for a couple of years, I think.

Hicke: They must have thought that was a valuable program.

P. Oertley: They didn't have to look around for somebody else. It was already established. I knew the situation. I also liked the principal very much.

Hicke: Who was that?

P. Oertley: His name was Bill Dickerson. He was one who was interested in traveling a great deal. In Aramco, in the three different districts, they had what they called the Aramco Natural History Society or something. It was an organization that employees had formed to make it easier for them to travel to different places, because every time there was a long weekend, people would go. In a situation like that you could go to Egypt, you could go to Syria, you could go to Afghanistan--just all over. And we did.

Well, in Abqaiq Bill Dickerson, the principal, was the big cheese in the Natural History Association; and he led some fantastic trips. One of the trips he led was to Oman.

[speaking to R. Oertley] And you didn't get to go for some reason. I guess you couldn't get the time off, but I went. That was really one of the most interesting times in all the trips we took, although it was only three days. As with the travel agent, one who knows their stuff--which Bill did by this time--everything was organized right down to the minutes if you wanted it and he had it really organized. Frequently the first thing you did on all of these things was to make sure there was enough gear on the airplane.

So we moved to Dhahran and I did that commuting. At one point, my mother died. I went home because my mother was dying. It may have been when my father died--they died about a year and a half between each other--but at one point I decided, "Well, this is a good time to quit." So I quit. By this time Bill Dickerson was the principal of the Dhahran

school. He called me, wanting me to do the art teaching there. I went for three days and I decided that I didn't want to do it anymore. In all this, I didn't have any time for my own work; so I quit--and haven't looked back. I've just been doing my own work since.

Hicke: I'm wondering: as we go along, do you have any observations about the growth of the medical facilities and the other people that were involved. Did you know the Gelpis and the Taylors and Nichols?

P. Oertley: Most of them were in Dhahran. Since we were first in Ras Tanura and then in Abqaiq, we would see them at parties. Social life was very important throughout all of the districts--lots of socializing. We'd see them at parties. But Bob and I don't play tennis; we don't play golf; and we don't sail. Well, actually he did sail when we were in Ras Tanura. We're not big organized-recreational people, and most of the things that we do are in very small groups. For instance, we would tend to be going out into the desert for overnight camping trips, and none of those people did that. It's really interesting: it seems like most of the people in the Medical Department played tennis.

Hicke: [laughter] This is a new trend we're finding here.

P. Oertley: Let's take that back, because Roger Nichols was a great going-out-in-the desert person. Actually, that's rare; he was a rare one.

Bob, wouldn't you say that's true?

Oertley: [at some distance] I wasn't listening to that.

P. Oertley: Most of the people in the Medical Department played tennis?

Oertley: Oh, yes.

P. Oertley: Not golf. Tennis. So, curious.

Hicke: Did you go with the Nichols on any of these trips out in the desert?

P. Oertley: Oh, yes. It was fun. Roger and Elinor were marvelous to be with. Roger always had things well planned. Elinor is a very good cook. She's also a good planner in a lot of other aspects of it. But I'm just thinking of some of the meals that we had.

Hicke: On the camping trips?

P. Oertley: Yes. And at their home, too. I'm trying to remember if Roger played tennis.

Oertley: Oh, yes!

P. Oertley: Yes, they played tennis.

Oertley: Yes, Roger was an avid tennis player.

P. Oertley: You must remember this is corporate life, too.

Dhahran Medical Facilities and Other Services

Hicke: Oh, yes, sure. Did you yourself use the medical facilities?

P. Oertley: Oh, sure. Yes.

Hicke: Just looking at it from a patient's--

P. Oertley: From a patient point of view? Oh, I thought it was great. Let's see. My feeling was that I was happy with the services I got, whether it was in the hospital, in the clinic, or in the dental office. I thought they were well set up. I always felt that the treatment I received must have been good because it worked. [chuckles]

We never had long waiting lines. There was that. You could request the doctor that you wanted to see. It wasn't always that way: if you went in saying, "I have a terrible cold; I want to see somebody," well, you took whoever was on call. It was obvious in the beginning that Americans wanted to see Americans, but I think as time wore on that they realized that the other nationality doctors were trained.

I had each eyeball operated on, not at the same time. In that case--

Hicke: In Dhahran?

P. Oertley: In Dhahran. Two different doctors operated on me. They were both Americans. But I also had other surgery, and that was performed by a Jordanian. Many Jordanians are Palestinians who need a passport and they can always get a Jordanian

passport. But they consider themselves Palestinians. And he was a lovely man.

Hicke: Okay. I'm going to change this.

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P. Oertley: What a shock it was for returning Americans to discover that health care in the U.S. was a bit different--it's run like a business. It's hard for people coming back from a situation like that to realize that a clinic is not available at their beck and call as it was there.

Hicke: I expect in that case, and in other cases too, that services weren't available.

P. Oertley: That's right.

Another aspect of life there that was interesting from a woman's--man's too--point of view was that the other services that they offered us were plentiful. Grocery stores: in the beginning, there were no places to buy anything, so they had to build grocery stores. That's the fascinating thing about the history of the company, how they had to become experts in all these other things, not just oil. They had to hire people to do this, to build a this, that, and the other. They needed a place for the women to shop once the families came over, and they built grocery stores.

When I first arrived in Ras Tanura, as I remember it, it was a fairly small store but certainly adequate. The only thing that you had to remember was that you couldn't always find what you wanted because of, again, this business of ordering and waiting for it. Also, you went to buy flour; you didn't go to buy Gold Medal flour. And you went to buy frozen peas, not frozen tiny deluxe. You just hoped for that, but you had to be flexible.

Some of the stories of the early times, from a cooking standpoint, were really interesting. We all became experts at debugging flour, substituting various things for things that they didn't have, and sharing stuff for birthday cakes and that sort of thing. But by the time we left, we had supermarkets. We also had something called a pork store.

Hicke: Just to get it in the record, you stayed until '82. Is that right?

P. Oertley: January of '82 we left.

They had what was known as the pork store, which was a set-aside room in the supermarket that non-Moslems could enter to buy their pork products. It was well documented what you bought, because they recognized the opportunity for people to buy huge amounts and give them away or sell them, which I'm sure some would do. So we had pork store. But I understand they don't have that now. I don't know.

Before, when I first went there, what was available was on the counter along with everything else. And they did have bacon and pork products. But that was because the people using those stores in the beginning were always non-Moslems. It was only after this [Moslem] trained personnel became higher up in the company and then they were allowed all the other privileges, you might say, of the higher ups, could they come into the stores; and here they are confronted with pork which of course they're forbidden to eat. That's when that was taken out of the general store area and we had our own little pork store.

Adjusting to Cultural Differences

Hicke: What about liquor? You couldn't buy any wine.

P. Oertley: No, you couldn't buy any. People did make some. We made wine. I will admit that about the first month we were in Dhahran, someone offered us a case of scotch or gin, and we bought a case of scotch and a case of gin. Someone had smuggled it in somehow. Friends somehow knew that it was there, and so they were asking their friends if they wanted some. So we had a case of scotch and a case of gin, and that lasted us the whole time, because we didn't drink that in the house. We drank my wine. Now, when guests came in, if they wanted gin or scotch, we could offer it to them--which is very nice. Tanqueray gin, and black-label scotch--Johnny Walker.

The wine I made was of raisins. I also sometimes used frozen blueberries. There was a simple formula: so many boxes of raisins or bags of frozen blueberries, so much sugar, so much yeast, and so much water. You dumped it all together. I used an old acid jar, which was a big, five-gallon glass jar that had a small top.

Hicke: Like an amphora shape?

P. Oertley: Yes.

Oertley: Exactly.

P. Oertley: Except it had a straight bottom. And when I poured all that stuff in it, then I just put aluminum foil over the top, and poked a hole in it. That was our wine.

That was not the appropriate way to make wine. You're supposed to have airlock and all the other, but it worked. The wine was delicious. It tasted a little bit like sherry. We never had enough left over so that I could set some bottles aside and let it age.

Hicke: [laughter] Any other things that you particularly missed?

P. Oertley: I always felt like I wasn't missing much of anything. I felt that the bonuses were so much greater than any small thing I might miss. We had a very good life over there. Some women, especially the ones who came in later, would complain about so many things. I think it must be because many of those women were the ones who had been raised to think they should have a job right away when they got out of college; they should be able to do many, many things because they were women.

You had to forget that you were a woman. You had to forget that you were a woman in the fact that if you wanted to live a life there that was satisfying and productive, you just had to figure out how to do it. It was all there. There were some things you were not allowed to do. One was you were not allowed to drive a car outside of camp. You didn't need to; there were taxis, there were buses, and men with cars--your husband or your friends or whatever to drive you around.

Now, some women took that as a personal affront to their God-given right to drive a car anywhere they wanted to. I never felt that. Actually, I never had a car until we came here. All the time I was a young adult, I wasn't in a place where I needed a car. I don't think I learned to drive until I was twenty-one. Not being able to drive outside was the biggest sore point with many women, and I've never really understood it because you didn't need that; you could do everything you wanted to do with a taxi, with a bus, or with your husband or with your boyfriend. For me, that wasn't a lack of freedom.

Some of the women felt that the fact that they couldn't wear what they wanted was a personal affront to their freedom. I never felt that, because I think I was raised to know that you dress according to situation. I mean, even now you dress according to the situation: I guess the best description of

knowing what to wear, what not to wear, was when not wearing a bra, burning the bras, was popular. At that time, the company was expanding some and they brought in a lot of European secretaries, mostly from England. Well, I'm exaggerating of course, but by the time you saw them, it was a t-shirt with no bra and a very short skirt. That's in a traditional setting where women are completely covered; it's nonsensical. It's not only bad taste, it's asking for it, really--at least that's the interpretation the young male would have.

So, as far as I was concerned, I was happy to wear long pants, which is what I wore, and long-sleeved shirts. It made so much sense in the hot weather. We could go into the local towns and buy Indian outfits; that's real thin cotton, they're colorful, and they're batik or they're tie-dyed. I had quite a colorful wardrobe. I liked that. And I always felt too that I was, as a woman, really safe around Saudis, because that's the way they were trained. So none of that ever bothered me.

When people ask me today, "Oh, what was it like to be a woman in Arabia?" it gets a little tedious trying to explain it to them; many people don't understand. I think it's simply because you have a different mindset--or I had a different mindset--and it's that business of, in some cultures you don't do this, in other cultures you can't do that. It's like going to Italy and women wearing shorts and sleeveless shirts in the cathedrals. They ask you not to do it; and yet some do. And I often wonder: didn't they have any home training? Didn't anyone ever say, well, that's just not done here.

Hicke: If you go to a Japanese home where they take their shoes off, you take your shoes off when you go in.

P. Oertley: Okay, it's that same mindset. Some didn't get it.

I liked the interactions that I had with the Saudis. At one point, I was in a group who used to go out into the villages once a week for socializing with the Saudi women. I don't know how this got started, but I think it was the wife of the head of Industrial Relations.

Hicke: Who was that?

P. Oertley: I can't remember offhand. I can see her face, but I can't remember her name. I think she started it and she asked a group of us if we'd like to go. Somehow, her husband, through one of his employees, had arranged for us to go to a Saudi home. The women were expecting us. We just simply spent a

few hours there as the Saudi women do when they go visit other Saudi women. They lay out a table that you wouldn't believe. It's tea and it's soft drinks--lemonade, iced tea, fruit drinks, all sorts of things to drink--nothing alcoholic, of course. Then the table is spread with sweet stuffs and other stuffs like hummus, babaganoush, and stuffed squash--all the Arab dishes. It was a feast.

We'd usually go early in the morning--well, ten o'clock--and come home a little after lunch, stuffed. They wore their finest; we saw them, of course, without the black abba on and no veil. Many of them were beautiful young women. Then we reciprocated: they would also come to our house.

Hicke: Did you have to have an interpreter to talk?

P. Oertley: Well, most of us had taken Arabic enough so that we could do some talking. There were usually, as I recall, one or two of the Palestinian women who went with us. They were fluent in both languages. With the Saudi women, most of them weren't educated and when you tried talking in another language to someone whose language that is but who is fairly uneducated, they don't slow down. They don't realize the difficulties that you're having with trying to speak their language. It was not always easy, and not always successful, but it was a great contact.

Then, they would also come to our houses. We didn't have the tables spread as well as they did. We were supposed to make sure that it was at a time when there weren't any men around. They arrived, always driven in a car by a driver; all families have drivers or brothers or somebody who's supposed to do this because the women of higher economic status were attended to in this manner, if they have any money at all--and most of them at that level had very nice houses.

So they would come and they were driven in cars, usually two or three women in a car, all draped in black. They'd come in and throw off this black stuff. Gosh, there was one woman who was so beautiful, and she wore a hot pants outfit. Many of these outfits were European and expensive. I can remember thinking: "Oh! What they would give for her in Hollywood." But they wanted to talk about clothes, lipstick, you know, stuff like that. You could talk about family and stuff, but they were really interested in what they saw of American life on television.

Hicke: Did you have to refute some of that, tell them that isn't exactly how we live?

P. Oertley: Sort of. They never really came out with questions on a basis like that. They'd ask about movie stars. They'd want to talk about clothing or where they had things made, things of that nature. You didn't have an intellectual conversation or something meaty--certainly because none of us had that facility in the language, so it was impossible.

Hicke: What kind of education had they had?

P. Oertley: Not much. Some of them had been a little way into high school. I remember the one with the hot pants outfit said she was taking private lessons in something; but she told us it was from a man, and I just couldn't imagine how that could be. But maybe it was.

We did that, off and on, over a couple of years, I think. They enjoyed it; we enjoyed it. They always thought it was funny when they came into a house that had Arabic stuff--you know, that half moon shape over the door there [points to her own doorway] which I think originally had been over a gate somewhere. They thought our interest in their carved wood Arab chest, things of that sort, they always thought that was funny.

Hicke: They had it in their houses, didn't they? Or did they? Rugs?

P. Oertley: Well, not really. Rugs, yes; but rugs are different. Rugs cost money and rugs are accepted in Western decor as well. But most of the houses had what you could buy in the local stores; it was usually European. There might have been a lot of plastic on it, as well, some in very good taste, some not. But it was what was available locally. Towards the end too, they were getting married in white dresses.

In one of the first teas we went to--we called them teas, but it was in the morning--they got in a group of women to dance for us and play musical instruments like they do at a wedding. That was really interesting. Many of the Saudi women there wore the outfits that they'd wear at a wedding, and they danced. And then they wanted us to dance with them, stuff like that.

Oertley: I rode a bicycle back and forth to work at the hospital. I knew Pat was hosting this women's group one time. When I got home, Pat said, "You're just five minutes too late. You should have been here just a little bit earlier today. They were really dressed to the hilt today." All of the drivers had come for them, knowing that this was the time that men come home and the women should be gone.

- Hicke: You would have been kept out of the house, if you had come home, wouldn't you?
- Oertley: Of course. She wasn't chastising me for being late; it was a matter of "You should have been here, but you couldn't."
- Hicke: Would they allow you to take pictures of them?
- P. Oertley: I don't think that ever occurred to us. Perhaps they would have, I don't know.
- Hicke: Interesting.

What about dishes? Did they have something special in the way of china?

- P. Oertley: Oh! China. Again, that was locally purchased and probably European. They didn't have a history of locally made clay or glass. There were some potters, but that was very utilitarian. The pots had been made originally to hold water and oil, things of that sort.
- Hicke: Did they use the copper coffee pots and things like that that are so beautiful?
- P. Oertley: They use those on the desert.
- Hicke: And the trays?
- P. Oertley: On the desert mostly.

I think now it's different. I think they've reawakened the Arab pride and they too would want to use the motifs like we used in our homes. They probably recognized the worth of it simply because we began collecting these things and using them. Now there are museums in the country that show these things off, and some of them are very beautiful. The museum in Riyadh is especially well done.

Leaving Saudi Arabia

- Hicke: Before it gets too late, let me ask about why you decided to leave Arabia.
- P. Oertley: Oh, I felt Bob was working too hard. And I thought his temper was getting short.

Hicke: [chuckles]

P. Oertley: You know, you're going to retire at some point, so why not now? So we did. It was a good time.

Hicke: And this was 1982.

P. Oertley: Yes. January.

Hicke: So what did you decide to do?

P. Oertley: Well, we already had the house built, so we knew we were coming here.

Hicke: Tell me about that. Go back to how you found it.

P. Oertley: [speaking to R. Oertley] In '76, you were going to a rabies conference in Portland, Oregon. We decided that it was time for us to look around in the northwest. So we drove down the Pacific Coast. I wanted to see Coos Bay, because it was on the water, and I liked the sound of the name. We stopped at Coos Bay. It was like twenty-five years in the past. It was not attractive; besides that, they had all of this yellow pollution in the water from the mills. So we kept on going.

Bob wanted to see Klamath Falls, because in the army, he had a buddy who told him about geothermal energy that they were using in Klamath Falls. We got there, and again, it was like twenty-five years ago--almost a time warp for both of those places. We stayed overnight somewhere. Then we drove up through south of here and it was very attractive. Actually, this was in February. We stopped at Sun River to stay overnight, because we had some friends who had places here: for instance, the Jungers had a place here; and the company pilot, whose name I don't remember, Lundquist or Lundgren or something like. They had a place. And she especially had shown me pictures of this, that, and the other. We knew that there was a nice lodge, so we stayed overnight at the lodge and had dinner. It was great.

On the way out, we passed a sign that said "Sales Pavilion." Bob said, "Well, why don't we just stop?" So we stopped. A woman took us all around; she took us up here and she showed us this lot, so we bought it.

Hicke: Right then and there?

P. Oertley: Yes. Yes, right then and there.

Hicke: Good for you.

Oertley: Incidentally, the whole ring here was bare of houses.

P. Oertley: This was the end; and now we're in the middle. There was nothing north of us. She had a plane. After we did this, she took us up in her plane and all over. You could see the roofs and the trees and the snow. It was really beautiful. That was in '76. In '79, I guess, we decided to start building. And all this was from a distance. Bob came back at one point to see how things were going. Good thing he did, because they didn't have the windows up there [pointing to windows], so we had to remind them that they should have put windows up there. We made some changes and we put in some skylights. That was necessary. We moved in March of '82.

Hicke: And did you retire pretty much completely from practicing medicine?

Oertley: Completely. I've not done anything medically since--

P. Oertley: You did some consulting.

Oertley: Well, yes, but I mean the hands-on kind of playing doctor.

P. Oertley: But you did some consulting and you were invited back to Arabia for a conference with the Saudi government. It was concerned with your public health program.

Oertley: The last couple of years that I was there--I mean when we were living there--I began to go in to see the Minister of Health, because there were certain things that needed to be done in the matter of malaria control and Schistosomiasis and things of this sort. We would treat patients until you're blue in the face, but if you aren't doing something to prevent some of these things-- I even had somebody come over from CDC, Center for Disease Control, to accompany me one time.

Later on the Minister of Health took all this seriously. I even encouraged him to go to meetings outside the country: "Go to something in Egypt sometime, or London. Your government can afford it." I know he did. But I was invited back at one point to deliver a paper on something relevant to our health at a meeting. I said, "Well, look, I can't do it in Arabic." They said, "No, no, no. We will have translators. So please come." I went and it was great. It was marvelous, because it was sort of like having planted a seed that you didn't know if it would grow or not. And it had

grown. And he wanted me to know that this was growing and he didn't just sit on his haunches and think about it.

Hicke: So you were responsible for that development.

Oertley: Yes. It was nice that the seed had fallen on fertile ground.

Hicke: Yes, that's true. This was 1988, I think you said, that you went back.

Oertley: Yes, something like that.

Hicke: [to P. Oertley] And did you go back with him?

P. Oertley: Yes! That was marvelous. I like to explore on my own. Although there were other women in this group of us that went, all of the women were there for work except me and the wife of another physician. I was real happy that they were in one place and we were in another [chuckling] because I could go and do my thing.

So I would go out in the morning and get a taxi. I knew that we were going to be in Riyadh and that I would have to dress very appropriately, so I had a long trench coat and fairly long skirt. But I didn't cover my head. I would go out in the morning and get a taxi. I knew where I wanted to go. I thought of the old souk. I had my camera with me, but I knew too that it was more difficult to take pictures there than it would have been, say, at Dhahran or Abqaiq, because they were used to Americans there. So it was a very small camera and I just sort of surreptitiously took a shot here and there. But I had a marvelous time until they moved Bob and me from where we were to where everybody else was. That sort of curtailed my ability to move around.

Hicke: Cramped your style! Well, I think we're just about coming up on the end. Is there anything more that you want to include, either of you?

Oertley: No, I think not.

P. Oertley: I will say this: I think we both had culture shock when we came back here--culture shock in that it was very difficult to find anyone to talk with who had a world view. Even now, at times, it's amazing how many people can't see beyond the shores of the United States. I think it's a real mistake, because we're all bound up in it; what happens elsewhere does affect us.

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P. Oertley: I wanted to say that I think it is a mistake for people not to realize that what happens elsewhere in the world affects us, and vice-versa. But many of the people that we talk with still don't recognize that. I know that we were very aware of it, because we had lived outside of the United States. So often, even those who do just a little traveling don't recognize that.

I think it's changing a bit, certainly, because more and more people are getting outside of what they know. You can't stay in the same place forever and think it's going to be like that forever. It's not. We need to recognize that although we are all the same, we are still all different, and you have to respect the differences. Part of the problem, I'm sure, with what's going on in the Middle East is what's always been the problem with this business of respecting differences between two different tribes, two different cultures, or two different religions, whatever it is.

That's what was this "culture shock" for us when we came back. We were somewhat aware of that before, because when we went home, on vacation--

Oertley: This was our rehab.

P. Oertley: --here, to the United States, frequently the families were very happy to see us. For about thirty minutes they want to hear about your life.

Hicke: [laughter]

P. Oertley: So we knew there was not a big interest in the Middle East.

Oertley: But you know, I don't think people can be blamed for those attitudes. The traveling is what changed it. We are pleased with where we've been and intrigued by the world out there, outside of America. Sometimes you get involved in a conversation with someone, and not necessarily about travel, but their attitude about particular peoples or cultures or places. You sort of--

P. Oertley: You recognize a dead end.

Oertley: Yes. And you realize that I don't really want to discuss this with this person because I'm not going to change his mind, and he won't change mine. It's better to change to subject.

Hicke: Yes. We can agree on the weather or whatever.

Oertley: For instance, it's very pleasant to communicate with you. You're open and like a sponge, soaking it up naturally and taking in the attitudes that we have. I can see it.

P. Oertley: Oh! There's one very important thing I forgot to mention. As a single woman going to Arabia, when I was first there I recognized that most of the people in power that I had to deal with were men; and they did not recognize women in the company same as men in the company. That changed, fast.

Another thing changed fast too, and I remember this vividly. We talked about those olive snails during the full moon or whatever it was, when they did their mating ritual of going in circles; you never saw tar in the water or on the sand at that time. Later, the tar began to come in; it was polluting the beaches. I could see the difference in the fact that I didn't see those snails there any more. We were at a cocktail party one night. I remember sitting with whose-name-I-won't-mention. And I can remember saying to him, "You know, that tar and the oil that comes up on the beaches of Ras Tanura is terrible. It's really a problem." He replied, "Oh, it's no problem." And this was a man who really could have done something about it. So that was his attitude: no problem, not going to do anything about it. That changed fast too because of the fact that worldwide it became such a problem in the business of debunking the--

Oertley: De-ballasting the ships. They can't cross back empty. They load their ships with seawater because they are not seaworthy unless they have proper ballasting. But then they'd get into the Gulf and de-ballast. And now here were these globs of oil which were--

Hicke: That came out with the seawater they dumped. Interesting.

P. Oertley: I remember that conversation to this day. I kept telling him how the sea life in the region was becoming affected. You could see on the coral--that whole area's just filled with coral--you could see the deposits on the coral reefs. I was telling him about it. He didn't exactly say, "You don't know what you're talking about. You're only a woman."

Hicke: [laughing] But you felt it.

P. Oertley: Yes. And it changed. It finally changed. He was still there at the time. I often wondered how it came about, but it changed; that was the important thing.

- Hicke: How did the status of women change? Because they hired some women?
- P. Oertley: The status of women changed because the men that they hired changed, and their wives were influential. It was somewhat a generational evolution.
- Hicke: It was happening everywhere.
- P. Oertley: Yes.
- Oertley: The Saudi men were also going abroad a great deal. They began to bring back things or take their wives with them. Once that happened, the exposure is like an ignition. The thing now is started. He also wants his wife to be more like those he finds outside the area. After all, she is his wife and--
- P. Oertley: --the mother of his children and all of that. Those things did change, nicely.
- Hicke: [To R. Oertley] So you're talking about the status of Saudi women, but you [P. Oertley] were talking about the status of women in the company, weren't you? At first?
- P. Oertley: At first.
- Hicke: So both situations changed.
- P. Oertley: As they did everywhere else in the world.
- Hicke: Well, let me just ask you: this is probably a silly question in view of all we've discussed, but if you had it to do all over again, would you go to Aramco?
- Oertley: Oh, sure.
- P. Oertley: Of course.

Aramco Management Support

- Hicke: Maybe you can tell me something about why, and why you Aramcons are unusual.
- Oertley: I was impressed by the fact that Aramco was aware of standards, for instance, in medical care. They knew what they needed, that it took medical people to bring in the ideas of

"Well, this is what needs to be done." And one of the things that I enjoyed immensely was the weekly management meeting. I began to go early on to them, on Friday I think it was. At this point, I can't remember precisely. I just sat and listened there because I was intrigued by what they were doing. It was only an hour or so long. Because I was clinic manager I was invited; but I didn't have to come. They needed a little input on the health side of things for whatever they were doing. I never encountered any objection to anything that I might want to put in with; and I thought, boy, these fellows aren't just oil-oriented. I mean, even this matter that we talked about, the de-ballasting of the ships. That wasn't anything in health, but they were discussing those kinds of things. From time to time, some of the people would bring these kinds of things up because it was becoming kind of an issue in other realms.

I was so impressed by the quality of men, the officers. They had selected among themselves the right ones to be making the decisions. They listened to anybody about everything, even if it wasn't "How many barrels of oil should we upgrade to?" and so forth; it had to do with our presence in that country as much as anything else. Because they were depending even on Saudis' help in that area.

I could make a suggestion or at least highlight a problem and there was interest. They'd say, "Well, next week's session--can you come back with some potential answers to that? Are there answers? Is there anything we can do that's within limits of our means?"--not just some fly-by-night scheme.

I was impressed by the intelligence of Aramco management in a broader sphere than just producing and delivering oil. They were very interested in not despoiling Saudi Arabia or the Gulf. At the same time, they were interested when I would tell them about even an epidemic of whatever was going on, and that we were stemming it. They'd ask: "How does that arrive here? Where does it come from?" If I didn't volunteer on the weekly meeting, they'd urge: "Okay, doc, tell us what's new in medicine?" It was marvelous.

Hicke: I think that's a good note to end on, so I'd like to thank you both very, very much for the great interviews.

Oertley: Well, we thank you.

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